The Newsweekly for Information Technology Leaders
September 2, 1996, Vol. 30, No. 36, 146 Pages, $3/Copy, $48/Year

COMPUTERWORLD

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Chrysler opts for (Win) '95 model

By Frank Hayes

Imagine replacing every part on your car, one by one, while driving down the highway at top speed.

That's the situation Chrysler Financial Corp. finds itself in. The $339 million subsidiary of Chrysler Corp. will spend the next 10 months ripping out its information technology infrastructure — built using NextStep from Next Software, Inc. — and replacing it with one based on Windows 95.

Chrysler Financial's Paul Anders *hopes to recycle fours years of object-based code*

Not from scratch

"It's not like we're starting over," said Paul Anders, vice president of information systems at Chrysler Financial in Southfield, Mich.

Instead, the company's developers will try to reuse as much as possible from their four years of work with the object-oriented tools from Next to create applications built with Visual Basic and Visual C++ from Microsoft Corp.

The move, which will affect about 2,800 users at Chrysler Financial's 28 sites, will give users access to Microsoft Windows-based desktop applications, including Microsoft Office and Lotus Development Corp.'s CC:Mail and Organizer.

It will also test how easily the object-oriented applications

Chrysler, *page 115*

All shook up

Frankenberg exits Novell; users hint at NT defections

By Laura DiDio and Craig Stedman

Nearly a dozen Novell, Inc. users contacted by *Computerworld* last week said they were stunned by the hasty departure of CEO Robert Frankenberg. But many noted that the company had failed to develop critically needed marketing prowess under Frankenberg's leadership.

The executive's exit after more than two years in charge is the latest and most visible in a series of management shake-ups at Novell. The company is battling to keep Microsoft Corp.'s Windows NT Server from banging down the doors of its NetWare customers.

"It's incredible. This is about the fourth major Novell management change in two years," said

Novell, *page 14*

Air-cooled mainframes pump big iron

By Craig Stedman and Michael Goldberg

IBM next week will introduce faster versions of its air-cooled mainframes that users said finally have enough muscle to do some of the heaviest lifting in their data centers.

That will let a wider range of System/390 shops pull the plug on their big water-cooled machines, which are much more expensive to operate. And because IBM is being pressed for the first time by air-cooled competition from mainframe rivals Amdahl Corp. and Hitachi Data Systems Corp., the added power will come at a lower price than customers have had to pay so far.

Until now, the processors used in air-cooled mainframes couldn't handle big transaction applications, said Thomas Loane, vice president of computers and communications services at Alamo Rent A Car, Inc. in Fort Lauderdale, Fla.

But IBM's new Enterprise Server G3 machines are strong enough to enable Alamo to "wipe out our water-cooled systems," he said.

Air-cooled, *page 16*

ANNUAL SURVEY

IS managers make what?! They sure aren't sharing the wealth.

Lens Lenses

See Managing, page 62.

WHAT'S INSIDE

- Epilon Networks offers a blackbox booster said to speed TCP/IP exchanges. See story, page 6, *by Patricia Dryden.*
- Legal experts wrangle over whether Microsoft can be sued for antitrust violations. See story, page 8, *by Kim Girard.*
- The WorldCom/MFS Communications merger could bring users cheaper data and telecommunications services. See story, page 8, *by Kim Girard.*
- SAP R/2 users prefer to reap returns on their multimillion-dollar investments than to spend millions more on R/3 software. See story, page 10, *by John King.*

Users ask mail vendors: 'Can't we all get along?'

By Tim Ouellette

Like the data trapped in different computer directories at National Semiconductor Corp., Tim M. Crawford feels stranded.

That's because Crawford, a senior manager at the Santa Clara, Calif., company, knows that vendors have done little so far to make all that data — stored in different electronic-mail systems, network operating systems and corporate information directories — accessible from a wide range of applications.

So, Crawford and information technology shops nationwide are faced with E-mail systems that won't talk to one another and an inability to locate various servers and systems on the network.

They are also struggling with the nightmare of managing network user accounts and a lack of understanding about what resources are available on the network.

Mail, *page 115*

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Step lively

It must be harvest time for the unexpected. This past week has been fairly bursting with unusual and surprising news.

We've had unexpected job losses for CEOs at Novell, Quarterdeck and AST (see pages 1 and 32). And we've got users hanging on to fax technology in a surprising show of force (see page 55). Most of us apparently still prefer faxing to E-mail or voice mail as our business communication method. Who knew?

But first, take a look at the startling plans of Chrysler Financial Corp., detailed in our page 1 story. The automaker subsidiary is about to give Steve Jobs a major case of unexpected heartburn. It is ripping out its IT infrastructure, built using NextStep from Jobs' Next Software. In its place will be one based on Windows 95, Visual Basic and Visual C++. Why is it doing this, when users were relatively happy with their NextStep applications? Mainly because those users griped that they couldn't use popular Windows-based applications on their desktops.

This real-life example mimics the nightmare scenario that haunts Sun Microsystems CEO Scott McNealy: that the longing for familiar Microsoft programs such as PowerPoint will keep the PC desktop firmly anchored in the souls of corporate users who could move to network-centric computing instead.

Another example of the unexpected can be found in our Corporate Strategies section (page 59). The IS department for the city of Phoenix bravely decided to find out if the work it does is actually appreciated by users. IS performance evaluations shifted from project-oriented measures — such as counting PCs — to performance-oriented metrics that track user satisfaction. Who'd expect such a customer focus from a government agency?

But for those who take comfort in the more expected course of events, check out our annual salary survey (page 62). It begins by appropriately pointing out that this is the Chinese year of the rat. The IS rank and file will read on to discover that most of this year's hefty salary hikes went to the very top positions in IS. And did the big bosses share that wealth with their faithful staffs?

Well, what do you expect?

Maryfran Johnson, Executive editor
Internet: maryfran_johnson@cw.com

The 5th Wave by Rich Tennant

Will Apple buy OS or let it Be?

By Lisa Picarille

A coy Jean-Louis Gassee, president and CEO of Be, Inc., refused to confirm or deny a report in *The Wall Street Journal* last week that claimed Apple Computer, Inc. is negotiating to buy the start-up company's BeOS.

Apple's own operating system effort has sputtered along in the past two years.

The latest Apple strategy revision calls for delivery of new Mac OS enhancements every six months instead of the previously planned megarelease code-named Copland. Cupertino, Calif.-based Apple has met with increased criticism that it won't be able to deliver the basic underpinnings necessary to compete against rival products such as Windows NT.

Full load

Some Apple insiders have said that Menlo Park, Calif.-based Be's operating system, due early next year, is chock-full of the latest technology — such as multiprocessing, multitasking, multithreading and an object-oriented programming language — and could be the savior of Apple's Mac OS effort.

Gassee has an inside track at Apple because he was formerly its chief technology officer.

He attributes the increased buzz about Be to the company's recent announcement that the BeOS will run on the Power Macintosh in addition to his company's BeBox.

"The Power Mac port of the BeOS has excited imaginations. This might be the explanation for these rumors," Gassee said.

News Shorts

Ludwick still at helm

In an interview with *Computerworld Hong Kong*, Bay Networks, Inc. CEO and President Andy Ludwick said reports of his departure from Bay are incorrect. And Bay spokesmen last week said Ludwick remains Bay's CEO and president and continues to oversee daily management. They attributed the speculation about Ludwick to a briefing of financial analysts he gave in late July, when Bay reported weak fourth-quarter and full-year earnings. At that time, Ludwick described "succession plans," begun in 1994 during the SynOptics Communications, Inc./Wellfleet Communications, Inc. merger that created Bay. Those plans were designed to focus the company's sales, marketing, support and corporate management. Despite a May realignment into three business units, Bay's performance on all fronts remains troubled, according to observers.

Realtors agree on site

The **National Association of Realtors'** board of directors last week voted to continue funding the group's Realtors Information Network site on the World Wide Web. The site — a $13 million, 27-month effort — has achieved limited results, according to industry insiders [CW, Aug. 12]. The board approved a proposal to outsource management and development of the site (www.realtor.com) to a third-party vendor.

Corel plans PDA

Corel Corp., best known for graphics software and its purchase of **WordPerfect Corp.**, is working on a personal digital assistant (PDA). The Ottawa company said the device, which will cost less than $500, will give users Internet and Web access, let them send and receive faxes and do some basic calendaring and scheduling. Corel officials said the device could come out as soon as next March. Corel is also working on a Java-based suite of Internet-related applications for the PDA.

IBM, NHL score deal

IBM and the **National Hockey League** (NHL) plan Tuesday to roll out a plan to give the NHL a more global presence. Sources at IBM said the deal will focus on networked computing and the Internet.

Apple's Office romance

Things are getting a bit cozier for rivals **Microsoft** and **Apple Computer, Inc.** The two companies have signed a deal under which Microsoft's best-selling Office for the Macintosh suite of productivity applications will be bundled with some Power Macintosh models in Europe. Microsoft already has a similar, but nonexclusive, bundling deal in the U.S. with Macintosh clone maker Power Computing Corp.

Compuserve stumbles

H&R Block, Inc. officials last week said the company will delay spinning off its **Compuserve Corp.** subsidiary to shareholders due to the online service's losses, uncertainties about the future of the online industry and the introduction of new interfaces for the CompuServe and Wow online service. H&R Block directors had pegged Sept. 11 as the date they would present shareholders with the spin-off. CompuServe posted a quarterly loss of $29.6 million on revenue of $208 million earlier this month. No new date for the vote has been set.

AS/400 gets GUI View

Computer Associates International, Inc. has introduced a graphical user interface (GUI) for its IBM AS/400-based CA-PRMS manufacturing and distribution software. CA-PRMS View, introduced at CA-World '96 in New Orleans last week, was designed to coexist with traditional "green screen" extensions to the manufacturing system.

7.0 on the way

Banyan Systems, Inc. plans to ship Version 7.0 of its Vines networking software early next month. Vines 7.0 will integrate with Banyan's StreetTalk for NT directory and feature an enhanced workstation kernel, Simple Mail Transfer Protocol support and an upgraded file system. Vines 7.0 costs $9,995 for 100 users.

SHORT TAKES **McAfee Associates, Inc.** this week will announce an alliance with Seagate Technology, Inc. that will allow McAfee to include Seagate's Backup Exec NT server backup software in its LAN management suite. ... No. 1 notebook vendor **Toshiba America Information Systems, Inc.** will move into the desktop and server market next week by announcing a line of home computers. It plans to release corporate machines early next year.

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Novell knuckles down, and so do we

Frankenberg's out, and Novell's prospects look worse than ever. So goes the conventional wisdom.

QuickPoll: Novell makeover

Will losing Frankenberg end Novell's losing ways? Tell us what you think.

www.computerworld.com

Forum: The numb and the Net(Ware)less

Users may feel this way after all Novell's troubles and travails. Join *Computerworld*'s Laura DiDio and Kevin Fogarty online to talk about Novell's prospects and problems.

www.computerworld.com/forums/

Choice Cuts

The Webbing of the president.
The 'net's impact on the '96 campaign puts power in the hands of IS volunteers such as Libertarian Joe Dehn.
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The city of Phoenix
is measuring its IS department by how well it accomplishes its mission, not just how many projects it completes. **Corporate Strategies, page 59**

Richard Nowitz/FPG

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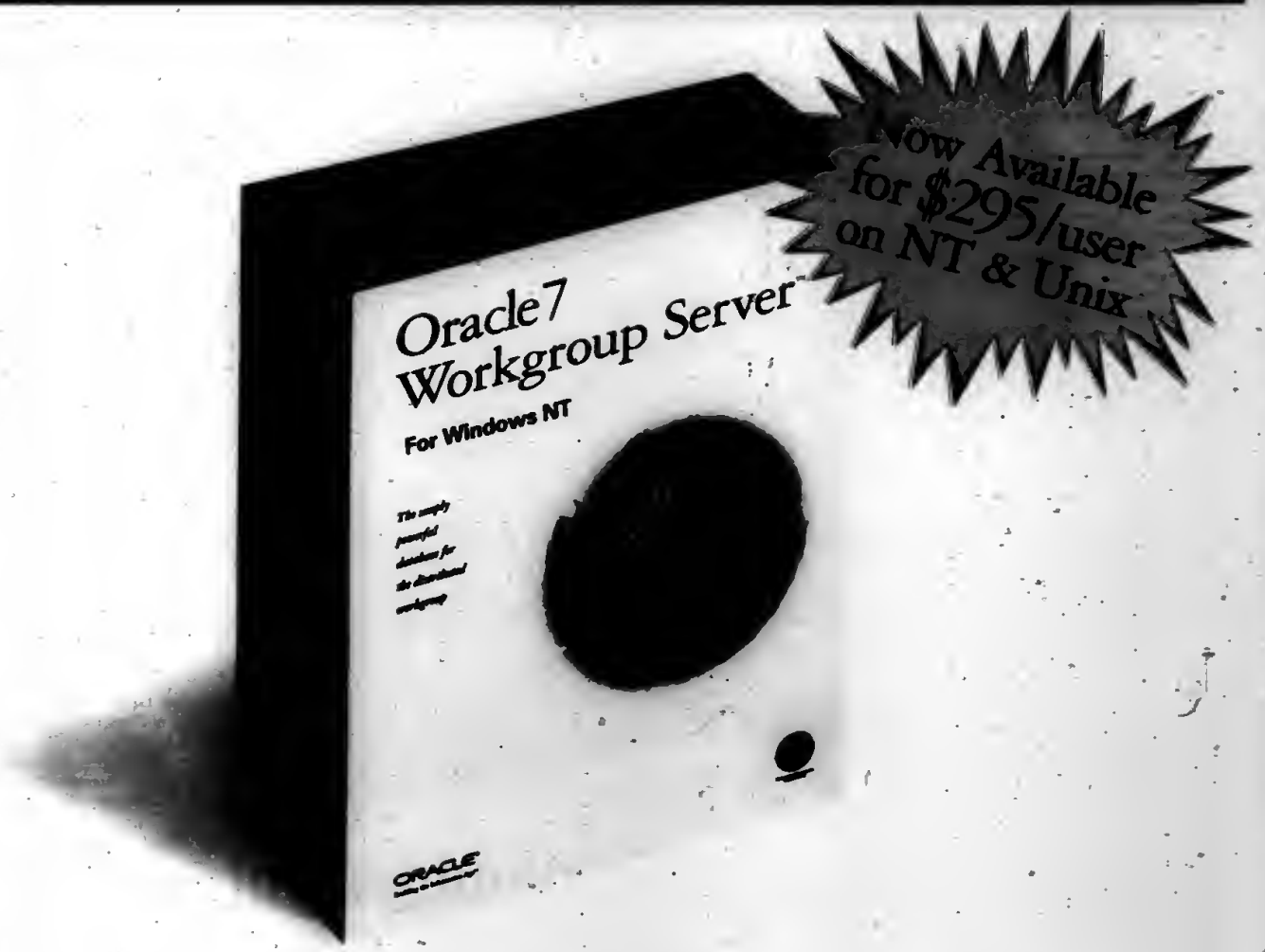

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Users wary of moving to backbone booster

By Patrick Dryden

Adopting new technology is tough when the promised breakthrough invades the soul of an enterprise network, the routing of its vital business traffic.

Ipsilon Networks, Inc. this week will seek converts to its implementation of Internet Protocol switching, a backbone booster that speeds TCP/IP exchanges through networks, intranets or the Internet.

That helps networked organizations that crave more efficient delivery for World Wide Web access and other compound applications.

ANALYSIS: Ipsilon Networks

The Palo Alto, Calif.-based evangelist offers a device that joins two dozen Ethernet or Fast Ethernet connections with one or more Asynchronous Transfer Mode (ATM) pipelines operating at 155M bit/sec.

But Ipsilon and a growing number of its allies must try to coexist with internetworking market leader Cisco Systems, Inc., which offers its own path to router enlightenment.

Ipsilon promises unaltered routing of legacy packets, the quality of service assured by ATM cell switching and a fourfold boost in performance compared with router-based backbone networks — at half the cost.

That should sound like salvation to managers of stressed networks. But few have heeded the call since Ipsilon unveiled the technology and its IP Switch ATM1600 in April.

"They're ahead of the market" in technology and user needs, said Fred McClimans, chairman of network market analyst Current Analysis, Inc. in Ashburn, Va.

"Look for a leap of faith to IP switching early next year," McClimans said. "That's when a rapidly rising number of managers will have to deal with the big crunch that should hit their backbones."

Surging sales of 100M bit/sec. Fast Ethernet switches for linking workgroups means many backbones will choke trying to aggregate traffic, McClimans said. Also, intranet implementations spell trouble for backbones because they shift traffic flow from local servers to peers throughout the network.

At J. P. Morgan & Co. in New York, "heavy use of Web and Lotus Notes applications has had a big impact on our network," said John Kit, infrastructure consultant. "We're looking at anything that can help us alleviate bandwidth problems."

IP switching is one possible solution at the financial services firm, but Ipsilon isn't the obvious choice for it. In April, Cisco launched NetFlow Switching, an option for its high-end routers. Also, other switch vendors have offered flow-control options.

Those approaches to migrating backbone technology sort traffic for optimal delivery.

Routed or switched?

They route short-lived conversations between end nodes for electronic mail and name look-ups, but they switch the flowing conversations involved in file transfers and multimedia delivery.

Ipsilon "goes far beyond Cisco by supplying the routing mechanism for legacy IP over ATM circuits," said Melinda LeBaron, an analyst at Gartner Group, Inc. in Stamford, Conn. "It's exciting technology, but we've seen only one client interested so far."

Analysts point out several reasons for user hesitancy.

Ipsilon's routing breakthrough will take time for big organizations to accept and evaluate. And few will want to tamper with a vital network that isn't broken or change hardware in their wiring closets, analysts said.

Also, many users remain skittish about embracing the embedded ATM. Some are holding back to watch the progress of even faster Gigabit Ethernet, which operates at gigabit speeds.

"Networks are part of the business now, so fewer managers want to take any risks," said Glenn Gabriel Ben Yosef, president of Clear Thinking Research, Inc. in Boston.

Loosening Cisco's grip

The biggest blockade in front of Ipsilon may be Cisco's market dominance.

"Ipsilon poses a fundamental change to Internet Protocol transmission that breaks with Cisco's routing tradition to embrace ATM switching," said Glenn Gabriel Ben Yosef, president of Clear Thinking Research. "A lot of large companies won't want to alienate Cisco as they evaluate this approach."

TI's Bob Childress *hopes to see a common standard for switching IP*

That is the feeling at J. P. Morgan. "We would look into Cisco's NetFlow first since they are our main router supplier," said John Kit, an infrastructure consultant at the financial firm.

Dallas-based Texas Instruments, Inc. also will probably follow Cisco's lead to switch IP traffic throughout its global network, said Bob Childress, a network management analyst at TI.

"I hope to see some common standard for this next step in routing," he said.

Standards already are in the works. Last week more than 20 vendors tested products that implement generic and Ipsilon-specific IP switching protocols. All are open and under the guidance of the Internet Engineering Task Force.

Amassing an army of internetworking vendors will help Ipsilon's IP switching cause, said Gartner Group analyst Melinda LeBaron. "Ipsilon must gain support by leading switch vendors — not just Digital Equipment Corp. — to remove the proprietary stigma."

Yet Cisco itself can be blamed for perpetuating its proprietary Internetwork Operating system through its own IP switching option.

— Patrick Dryden

Three Internetworking products debut. See page 52.

Java fuels remote hub management

By Patrick Dryden

This month, users of hubs from UB Networks, Inc. can embrace what analysts and users call the future of network management with the first Java-based tools for remote device control via the World Wide Web.

UB customers can use the NetDirector@Web tools to check the status of their hubs and fully interact with each one from any Web browser, either through their network or via modem.

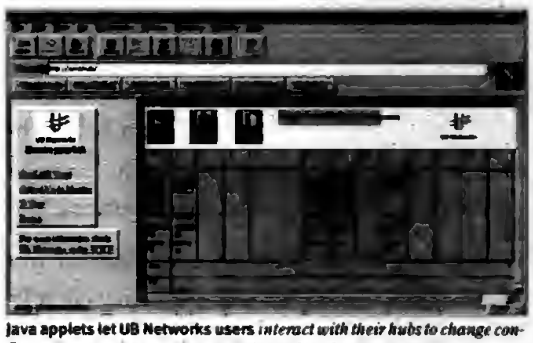
Java applets make remote configuration and other tasks possible by running on the browser, on a network management platform and even on each hub's EMPower management module. Then, for example, one hub can fetch software updates from the vendor's Web site to upgrade all other units according to specified management policies.

Such capabilities spell relief, harried network managers said.

"This will let us distribute management responsibilities to more people," said Ken Hall, associate director of network and communications at University of Pennsylvania Health Systems in Philadelphia.

Boosting efficiency

No longer must a staff learn Unix and OS/2 to configure hubs and handle users' moves, adds and changes through three NetDirector consoles, Hall said. Having a common access method will be easy to learn, and staff won't have to go to the control center to make changes. "So we can complete management tasks quicker and take on more projects," he said.



Java applets let UB Networks users *interact with their hubs to change configurations, not just monitor statistics and performance rates*

Network troubleshooters at Western Union Information Services in Paramus, N.J., will be able to check remote call centers that handle money transfers from home or anywhere, said Tom Shoop, director of systems engineering.

Another UB user sees a way to cope with growing network size and complexity.

Adding 4,000 nodes in hospitals and clinics during the next two years means "we must beef up our management by letting help desk and frontline support staff troubleshoot our network before tying up the central experts," said Richard Wells, director of network services and support at Geisinger Health Systems in Danville, Pa.

Wells said he looks forward to having a dial-up back door into each hub's embedded Web server so central staff can reach directly in to remote clinics when wide-area network links fail.

Many vendors are hurrying to provide a Web-based interface to their tools, "but nobody else is applying Java applets yet for interactive management like this," said Greg Howard, senior analyst at Infonetics Research, Inc. in San Jose, Calif.

NetDirector@Web "gives UB Networks users a jump" on technology coming next year from vendors that are developing Web-based Enterprise Management standards, Howard said.

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Software hardball

Industry debates grounds to investigate Microsoft tactics

By Kim S. Nash

Unfair marketing or the American way?

Legal experts say it will be tough to sort through accusations that Microsoft Corp. is using allegedly anticompetitive and illegal means to push its World Wide Web software.

ANALYSIS: Charges against Microsoft

Netscape Communications Corp. recently charged Microsoft with unlawful and unfair practices; Microsoft calls it capitalism at work.

Regardless, it isn't at all certain that the U.S. Department of Justice will get involved, despite Netscape's urgings.

In an eight-page letter sent to the Justice Department three weeks ago, Netscape claimed that Microsoft has paid off or coerced resellers and Internet service providers to carry its Internet Explorer browser.

Other charges included Microsoft's unduly delay in releasing application programming interfaces for Windows 95 and Windows NT to slow the arrival of competitive Web servers and browsers for those operating systems.

Microsoft flatly denied it all.

The question is whether Microsoft's product marketing methods violate laws or tenets of its consent decree with the federal government, said Michael Sennett, an antitrust lawyer at Bell, Boyd & Lloyd in Chicago.

A half-dozen PC makers and Internet service providers contacted by *Computerworld* last week were loathe to condemn Microsoft's sales methods.

"Microsoft can be difficult to deal with in any case, and they're obviously putting a lot of emphasis on the Internet. But are they doing anything more than usual? I don't really think so," said one PC company executive.

"Microsoft has simply started to hit [Netscape] directly with the same aggressive marketing assault the rest of the industry has come to expect," said a spokesman at PSInet, Inc. in Herndon, Va.

Still, the Justice Department has requested a written report about Microsoft's tactics in the Web server arena, according to Tim O'Reilly, president of Sebastapol, Calif.-based O'Reilly & Associates, Inc.

O'Reilly, which makes Web servers for NT, last month accused Microsoft of trying to shut down the market for Web server software on NT Workstation by artificially limiting to 10 the number of users who can be connected simultaneously to the system.

But the federal government will be reluctant to step in and rearrange what is an "embryonic market," predicted Steve Auditore, an analyst at Zona Research, Inc. in Redwood City, Calif.

Senior editors Bob Francis and Mitch Wagner contributed to this report.

Tell it to the judge

Netscape's charge	Microsoft's rebuttal
• Secret side payments and discounts for Explorer distributors	• All Microsoft marketing programs are "completely fair and . . . legal"
• Delayed information about Windows APIs	• A Microsoft team developed the APIs and "promptly shared them"

Telcos eye WorldCom/MFS merger

By Kim Girard

It may take a year or two, but telecommunications managers said WorldCom, Inc.'s planned merger with MFS Communications Corp. could bring cheaper data services and more affordable and reliable local and long-haul transmissions.

Telecommunications

One reason is that the combined entity, to be called MFS WorldCom, Inc., could provide stiff competition for the entrenched regional Bell companies and the long-distance carriers entering the local access market.

The rival carriers "definitely got a wake-up call" with this news, said Dennis Murphy, director of global telecommunications at Time Warner, Inc. in New York.

More competition should mean price cuts and service improvements, several network managers said. "I'm looking forward to [the merger] having an affect on the market price-wise," said Nancy Kinchla, telecommunications manager at Harvard University in Cambridge, Mass. "We are kind of counting on that."

Kinchla said she would welcome competition to Nynex Corp., which has been slammed for service shortcomings.

The merger also is expected to give corporate network managers one-stop shopping for local telecommunications service, long-distance traffic and Internet access. WorldCom, based in Jackson, Miss., is the No. 4 long-haul carrier. MFS in Omaha is an alternative local-access provider in 19 key cities. In April, MFS acquired UUnet Technologies, Inc., a Fairfax, Va.-based Internet service provider for businesses.

AT&T, MCI Communications Corp. and the regional Bell companies are trying to piece together the same integrated package of voice, data and Internet services, but WorldCom is ahead of the pack.

"Overall, in one fell swoop, [the merger] basically establishes WorldCom as the most integrated provider of services to the business market," said Bryan Van Dussen, director of telecommunications research at The Yankee Group in Boston.

"Basically, what you can expect is that the combined entity can totally cut out the [regional Bell operating companies] from the equation," said Mike Rothman, vice president of global networking strategies at Meta Group, Inc., a Stamford, Conn.-based consultancy.

Jim Harris, director of telecommunications at Warner-Lambert Corp. in Morris Plains, N.J., said WorldCom is strong on frame relay but needs to improve its voice services. The health care and consumer products firm has used WorldCom for leased-line service.

Under one roof

	LDDS WorldCom	MFS Communications, Inc.
Headquarters	Jackson, Miss.	Omaha
Profile	The fourth-largest long-distance telephone company in the U.S., targets business customers	Communications service provider to business and government. Offers local service in 14 major metropolitan areas. Recently acquired UUnet Technologies
Revenue	$267.7 million	~$267.9 million
Employees	7,500	3,500

Apple plug-in lets Web surfers catch 3-D wave

By Lisa Picarille

Imagine surfing the Web in 3-D, virtually flying through complex Web sites using a three-dimensional layout of how the information is stored.

That is what Apple Computer, Inc. is attempting to provide with a browser plug-in that gives users 3-D representations of World Wide Web sites.

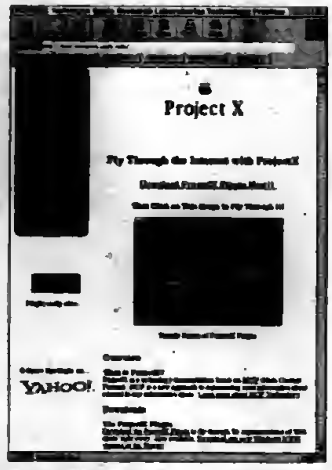
The Cupertino, Calif., company's newly sharpened focus on the Internet has spawned Project X, a Macintosh and Windows browser plug-in. A prerelease version of the plug-in for either platform can be downloaded for free from Apple's home page at mcf.research.apple.com.

One of the expected benefits of Project X is the time saved when looking for specific information on a Web site.

"I like the idea of the graphical nature of the product," said Clay Hutcherson, a systems developer at Centric Systems Corp., a firm in London, Ontario that has 1,500 Macintoshes. Centric develops networking technology to facilitate financial trading in Canada.

"There is a trend towards 3-D, and its seems like a natural step," Hutcherson said. "I use the Internet not for pleasure cruising but for resources; to be able to get to those resources more quickly and easily would be great."

Project X is the first product to be based on the Meta Content Format (MCF), an open file format created by Apple to find information on the Internet. Apple, along with Netscape Communications Corp., is pushing the platform-independent MCF as a de facto standard for Internet navigation. Yahoo, Inc. has committed to supporting MCF by creating an MCF-compliant version of its home page.



Apple's Web page *offers a prelease version of 3-D software for Windows or Macintosh*

Included in Project X is a tool kit for creating MCF maps of Web sites. That lets users to turn their sites into MCF-compliant sites that can then be navigated in 3-D.

The final release of the product is set for year's end, said Andy Lauta, manager of product marketing at the AppleNet division.

Reviews of off-line Web browsers. See page 55.

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UNISYS

The Information Management Company

PowerPC AS/400 to get an extra kick

By Michael Goldberg

IBM this week is scheduled to unveil performance boosts for PowerPC-based versions of the AS/400.

The new machines will have faster processors and features that support a World Wide Web database gateway, Lotus Notes and Windows 95 clients.

Much of Tuesday's announcement will center around Version 3, Release 7 of OS/400, the AS/400 operating system. This is the second OS/400 release for the 64-bit RISC versions of the AS/400 introduced last year. It will be available Nov. 8.

Older models of the AS/400 are based on slower, 48-bit complex instruction set computing (CISC) hardware but until now have had more features than RISC hardware.

For some transactions, such as database queries, Release 7 improves performance by up to 50% on the largest four-processor AS/400 systems, IBM officials said.

The operating system supports links to Windows 95 PCs that use AS/400 client software from IBM. The new OS/400 release also allows Web browser access to the computer's database through an Internet gateway called Net.Data.

Notes also is available through the Integrated PC Server, a second processor board inside the AS/400 that runs OS/2. Previously, only CISC models supported Notes.

Supporting role

- Windows 95 client access
- Net.Data World Wide Web gateway for DB2 applications
- Graphical user interface for SystemView management software
- Post Office Protocol for Internet mail

Users said they have come to expect annual performance hikes from the AS/400 division since IBM introduced the system in 1988. And even if they aren't ready to use every feature, the knowledge that IBM works to keep the AS/400 current with emerging technologies such as the Internet is a source of comfort.

David Jones, computer services director at the State Bar of California headquarters in San Francisco, said his office is excited to test the Web gateway to AS/400 databases and will look seriously at using Notes on its new RISC machine. "We've expected this news with some enthusiasm. We even would have liked to see Web support earlier," in the last release, for example, Jones said.

But equality won't last long, observers said, as IBM pours its development dollars into the newer models and puts older ones into maintenance mode.

Free upgrade

Version 3, Release 7 of the OS/400 is free if a user holds a license for an earlier release of Version 3, IBM officials said.

"RISC is the way of the future, and the older [systems] will be maintained as long as it is profitable. But all of the investment is on RISC. It's clear to anyone who looks at the product announcements," said David Peterson, president of Midrange Open Business Strategies, Inc. in Rochester, Minn.

The hardware side is one example of the RISC system superiority. IBM has cranked up the clock speeds on the PowerPC microprocessors used in the AS/400: from 77 MHz to 90 MHz for the AS/400 Models 40S and 50S; and from 154 MHz to 182 MHz for the Models 530 and 53S. Those improvements will be available Sept. 13, but IBM declined to release pricing information.

Just another lovely day on the water, right?

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REAL WORLD SOLUTIONS

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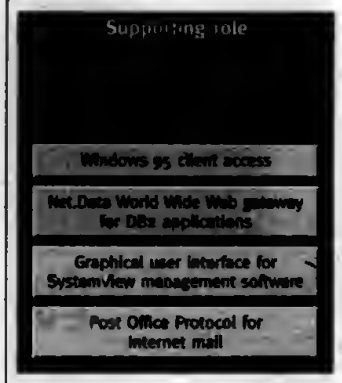

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by some wily hacker?"

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Ahead of its time?

SAP unveils R/3 4.0, online venture, but users may not be ready

By Julia King
PHILADELPHIA

Most R/3 users have yet to install SAP AG's latest 3.0 version of its R/3 client/server enterprise software. In fact, many have yet to even go live on the systems they have spent the past year or more installing.

But that didn't stop the software giant from announcing yet another new version — R/3 4.0 — at its Sapphire user conference here last week.

Sapphire conference

Scheduled for release next summer, R/3 4.0 will include new features such as transportation planning and scheduling capabilities, extended Internet-based supply chain functionality and financial enhancements for corporate controllers.

SAP officials also laid out R/3's new "componentized" product architecture, under which new versions of the software will be delivered and enhanced on a module-by-module basis [CW, Aug 26].

On the Internet front, SAP announced a partnership with Microsoft Corp., whose NT-based Merchant System server will function as the electronic retail platform between companies' R/3 enterprise systems and World Wide Web-based customers.

But whether users are ready for it is another matter.

"SAP is unleashing change way before its time," said Vinnie Mirchandani, an analyst at Gartner Group, Inc. in Stamford, Conn.

Experts estimate that 80% to 90% of SAP's base of 8,000 installations is on R/3 2.2. But the Internet programs will work only with Version 3.1 — scheduled for release in December — and higher.

Moreover, many users said they have yet to fully exploit all of the functionality in current versions of R/3 and even in earlier, mainframe-based R/2 versions of the integrated system (see story below).

"It can be a very fulfilling and a very stressful thing," said Kent Nunn, chief information officer at Farmland Industries, Inc., an $8.5 billion agricultural cooperative in Kansas City, Mo.

Farmland is one year into a four-year, multimillion-dollar reengineering initiative that includes implementing all R/3 modules, except human resources, across six business units with a total of 15,000 workers.

Because the software contains so many hundreds of business process options and configuration possibilities, "I don't think you ever get to a place where you're done with best practices in SAP," Nunn said. "You get to a point where you're done enough."

Attendees at SAP's *Sapphire conference got a peek at R/3 4.0*

SAP R/2 users content to count their returns

By Julia King
PHILADELPHIA

Users of SAP AG's mainframe-based R/2 software were anything but fashionable amidst the laser-lit glitz of last week's Sapphire extravaganza here.

"You're just not in vogue. It's like wearing designer clothes from the 1970s," said Don Champion, chief information officer at Cameron Corp., an oil drilling equipment manufacturer and R/2 user in Houston.

But Champion — like many other information systems executives at some 60 large R/2 sites in the U.S. — has no immediate plans to migrate to SAP's client/server-based R/3 system. The key reason: Their initial multimillion-dollar investments in the integrated R/2 software are finally paying off.

Eastman Chemical's Bob Dorsey *says most people still don't have R/3 up and running*

"We're now enjoying a lot of the benefits of SAP, albeit on a different platform [than R/3]. We have 1,000 users banging away on R/2, and the business reason to change just isn't there yet," Champion said.

Before moving to R/2 in 1992, Champion's division operated no fewer than 19 information systems. Now, he said, all information is processed via R/2, which has significantly streamlined operations and cut costs.

Also, switching from the mainframe version to the client/server software isn't cheap. Users need to buy new hardware platforms, upgrade distributed networks and purchase new R/3 software, which lists at $4,250 per user before any volume discounts are applied.

On top of that, for every dollar spent on software licenses, several more must be spent to install and implement R/3.

In the meantime, "we're running our companies with our R/2 software while most people here aren't even up and live on their [R/3] systems," said Bob Dorsey, an IS director at Eastman Chemical Co., an R/2 user in Kingsport, Tenn.

Still, other users question whether the R/3 client/server version of the enterprise software can handle their large transaction volumes and other specialized requirements.

For instance, General Mills, Inc. in Minneapolis relies heavily on pricing and promotions capabilities in R/2 that aren't included in R/3 yet, said Vandy Johnson, director of system development and support.

Free home page, for a price

CA NetHaven users get site, but other services will cost

By Thomas Hoffman
NEW ORLEANS

Pining for your very own World Wide Web site? Computer Associates International, Inc. is willing to build it for free.

Of course, there's a catch. The Islandia, N.Y., software giant doesn't have a track record in Web sites. Furthermore, additional Web site design and management services will definitely cost money, and in some instances, CA might even want a cut of the user's online revenue.

Nevertheless, through an Internet business division launched here at CA-World '96 and called NetHaven, CA is offering to build the first home page of a customer's Web site for free.

For additional Web pages and services, such as firewall monitoring and secured credit-card processing, NetHaven offers four service levels that customers can pay for monthly.

NetHaven's pricing, to be announced this week, is expected to be competitive with other players. Monthly services should cost $500 to a few thousand dollars, said Stan Lepeak, an analyst at Meta Group, Inc. in Stamford, Conn.

Low-end competitors, such as US Web Corp. in Santa Clara, Calif., don't have the financial wherewithal to offer free services in hopes of generating long-term revenue, he said.

Dutch Traffic's Peter Verkoulen *says the option of bolstering a free NetHaven site with paid-for CA software interests him*

Trading services

Like other deep-pocketed competitors, CA will provide low-cost services to some customers in return for a share of their online revenue, Lepeak said.

And unlike Internet service providers that charge for every content change in a hosted site, NetHaven will give users a set of templates that allows them to make their own site revisions — even without Hypertext Markup Language (HTML) programming experience.

The products include Web Database Wizard. A customer can use this browser-based tool set to change a product's price, for example, on the customer's site. To do so, the customer changes the entry in a CA-OpenIngres database.

That capability appeals to Dalton Han, marketing manager at Asian Food Net. The privately held New York company has a NetHaven-designed Web site (www.afn.com) that features a virtual shopping village of Asian specialty stores.

By outsourcing development and management of the site to NetHaven, Asian Food Net didn't have to triple its six-person information systems staff by adding HTML programmers, which would be expected. That enabled the start-up to save more than $200,000 in personnel costs, Han said.

NetHaven customers also have the option to buy CA software to help them support their sites, an option that interests Peter Verkoulen.

The senior technical adviser at the Dutch Traffic and Transport Research Center said the Netherlands agency plans to make data available to Dutch citizens within the next few years. CA's Unicenter systems management package "can help us monitor who has access" to specific classes of data, Verkoulen said.

"Now that my company is on the Internet, will I have to explain to management what a Resident Stealthed

Evil Empire

virus is and why it brought down the New York office?"

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Former Novell CEO Robert Frankenberg is credited with jettisoning distracting flotsam and refocusing the company on its core product lines. But he is also charged with failing to successfully market those products. Here is a rundown of analysts' opinions about the direction in which Frankenberg took some of Novell's key product groups and their probable future under the pending new regime.

NetWare

UNDER FRANKENBERG, NOVELL BARELY PASSES MARKETING 101

Analysts agree NetWare is far better than anything else on the market, but they fault Frankenberg for failing to develop it faster and for not putting together s marketing team that could convince users of its superiority.

GRADE: C

CAN NETWARE SURVIVE?

Even with the pending release of NetWare 4.11 – Green River – sales of NetWare are predicted to remain flat as users wait for s new leader to be brought on board. It's also unlikely Novell will gain new customers for NetWare, so the new regime must keep existing customers from jumping to NT, analysts said.

"There is a great reluctance on the part of Novell's installed base to move off NetWare, and Novell needs to take advantage of that," said Joe Clabby, an analyst at Aberdeen Group in Boston. "There's s lot of pressure to move to NT."

GroupWise

LATE TO MARKET AGAIN

Although they credit Frankenberg for holding on to GroupWise while jettisoning WordPerfect, analysts still hold him responsible for Novell not taking more advantage of the groupware market. They said Frankenberg wasn't aggressive enough and missed opportunities to catch up and grab s large share of the market.

GRADE: C+

NOT TOO LATE

GroupWise may lag behind Notes and Microsoft's Exchange, but it could still gain some market share due to the nature of the groupware market.

"There's so much confusion in the marketplace about what the products are about, it's hard for anyone to dominate," said Patrick Corrigan, president of the Corrigan Group, s consultancy in Tigard, Ore. "[Novell] needs to add in the hooks and links to Internet and intranet technology."

Novell Directory Services

FINALLY ON THE BALL

If there's one thing Frankenberg can point to with pride at Novell, analysts say it should be the handling of NDS over the past six mooths, including making it cross-platform so it can even run on NT servers. They credit Novell for not fighting Microsoft and instead finding a market for its own products.

GRADE: B-

KEEP ON TRACK

If Novell can get s marketing team in place that understanda the product and if it can get users in to try it, analysts said there is s bright future for NDS. But it will take s lot of work on the company's part to calm user fears about the turmoil in the executive ranks. However, the company may have an easy time of it because many users aren't concerned about the turmoil (see related story below).

But Novell may also find partners less willing to build on Novell products without s clear direction, said Dave Cearley, an analyst at Meta Group in Stamford, Conn.

NetWare Embedded Systems Technology

GOOD TECHNOLOGY BUT WHAT DO YOU DO WITH IT?

From a technical perspective, analysts give NEST high marks. But from a vision and marketing standpoint, it flunks. Or as one analyst put it: "Frankenberg transferred out of the class halfway through." Analysts chastised the company for pricing licensing rights out of reach of small and mid-size developers – the company's original customers. They also marked the company down for not understanding how to turn the technology into s useful product.

GRADE: D+

THE FUTURE IS HAZY

Analysts agree NEST is a good technology, but characterize it as in search of s market. No market has developed for it yet. Until that happens, they said, Novell will likely keep it on the back burner. "There's no indication the market is taking off," Clabby said. "You can't [predict] where the industry is going. NEST is going to continue to be s modest contributer for the next few years, but the embedded OS market is generally kind of bumping along."

Novell CEO exits; users hint darkly at NT future

CONTINUED FROM PAGE 1

Gary Wilkerson, program and external services administrator at Kaiser Foundation Health Plan, Inc. in Atlanta. The biggest concern is whether Novell can sustain its technical direction and product development through so much upheaval, he said. "I have my doubts, and so does my upper management," he said.

Mercer's Patrick Brennan: *Novell's long-term strategy is murky*

Patrick Brennen, network operations manager at Mercer Management Consulting, Inc. in Boston, said this management change makes Novell's long-term strategy murky at best. And that could give NetWare users even more reason to look at Windows NT Server, he added.

The shake-up at Novell "doesn't impact me in the short term," Brennen said. "But two years from now, I might be s loyal Windows NT oser. It all depends upon the directions Novell takes in the coming months."

What Novell needs, users and analysts agreed, is s CEO who can combat Microsoft'a marketing might. Frankenberg is credited with straightening out the muddled technology strategy that he inherited from former CEO Ray Noorda, but Frankenberg fell flat on the marketing side, observers said.

Frankenberg had no clear sense of leadership and vision for the company, said Patrick Corrigan, president of Corrigan Group, Inc. in Tigard, Ore.

"Novell has enough technology to sink s ship. What they oeed is some business common sense," said Joe Clabby, an analyst at Aberdeen Group, Inc. in Boston. For example, "the Internet is hotter than s pistol right now, and they're late," he said.

Novell just started to acknowledge the Internet at its Brainshare conference in March. Its first intranet suite for NetWare will ship this mooth [CW, Aug. 26]. Meanwhile, the dead-end excursions that Noorda made into businesses such as Unix and desktop applications drained resources sway from NetWare, which allowed Microsoft to lure customers to NT, analysts said.

Green River flows

NetWare 4.11, code-named Green River, is due this month aod includes some welcome enhancements, Brennen said.

But Novell has to improve NetWare's applicatioo server functionality so that it better matches up against NT's prowess, he said. It also must spell out plans for improving technical service and product marketing, he said.

Analysts said Novell has been slow to recognize and deal with the shift away from file and print sharing to the more expansive file, print and application serving that Microsoft can handle.

Adding to the uncertainty is the fact that Novell doesn't have s replacement for Frankenberg yet. Joseph Marengi, who was in charge of sales, was named president. John Young, s former Hewlett-Packard Co. CEO who serves on Novell's board of directors, became interim chairman.

But the company is looking outside for s new CEO, and Yoong said he doesn't expect to have an operating role after one is found.

Most users interviewed last week said Frankenberg's resignation won't affect their short-term purchasing decisions.

Despite his misgivings about Novell's future, Wilkerson said the 40,000 Kaiser Foundation users who run NetWare will continue to do so.

"There's no way you can use Windows NT Server now as an enterprise platform to network 40,000 or [illegible] 10,000 users," he said. "The domain directory would be s disaster."

"We've invested a lot in NetWare in terms of time, money and training, so it will take a lot more than s new team of executives to make me do a wholesale switch," said so information systems manager at an East Coast financial institution. But Novell's continued dithering "has left the door open to NT Server" as a possible future choice, added the user, who requested anonymity.

Whatever Novell's new CEO does will be too late for users such as the options and trading division of NationsBank Corp. in Chicago

It is 70% done with s migration from NetWare 3.x to NT Server, and there is no looking back, said Paul Canning, vice president of network services at the unit.

The options and trading division chose NT because it is more powerful and presented an easier migration path than NetWare 4.x, Canning said. "NT was a better fit," he said. "And we've found s real synergy with the Microsoft products; we have no intention of changing course."

Staff writer Randy Weston and assistant sections editor Kevin Fogarty contributed to this report.

Bad marketing, not products, topple Novell chief

By Laura DiDio and Craig Stedman

Bob Frankenberg just didn't blow Novell's horn hard enough.

That was the consensus among users, analysts and the two executives who took over for Frankenberg last week after his resignation as chairman, president and CEO of Novell, Inc.

"On the technological front, Frankenberg did a great job for Novell," said Robert Harbison, a NetWare user and principal at Network Integration Consultants in Sausalito, Calif. But Frankenberg was definitely out of his element when it came to marketing, he said.

For example, the former Hewlett-Packard Co. executive let Novell spend precious time and millions of dollars designing a new corporate logo when it "should have been getting the products out in front of the users," Harbison said.

Network Integration Consultants' Robert Harbison *says Bob Frankenberg was strong with technology*

A serious family illness also played a role in Frankenberg's hasty departure, said sources close to Novell. Reportedly, Frankenberg proposed to Novell's board that he take on a reduced role as just CEO. But the board decided that the company needed a leader who was more involved, not less, the sources said.

Frankenberg couldn't be reached last week for comment on his departure. John Young, a Novell director who has taken over as interim chairman, declined to comment on reports about the illness in Frankenberg's family.

But Young and Joseph Marengi, Novell's new president, were less reticent about what they conceded was the company's failure to boost its marketing efforts under Frankenberg's leadership.

"We have to get more aggressive and develop that intranet mentality," Young said during a teleconference last week. He criticized Frankenberg for "errors of emphasis" and vowed that Novell would become more visible as a marketing entity in the months ahead.

Users and analysts said they certainly hoped so.

Bleak future

In a report titled "Novell at the Crossroads," recently released by Forrester Research, Inc. in Cambridge, Mass., the analysts there paint a bleak picture of Novell's future unless the company reverses its abysmal marketing track record. "Frankenberg was an engineer, and his strength was technology," said Jon Olsik, an analyst at Forrester Research. "But going forward, Novell is in serious trouble without a guru to combat Microsoft."

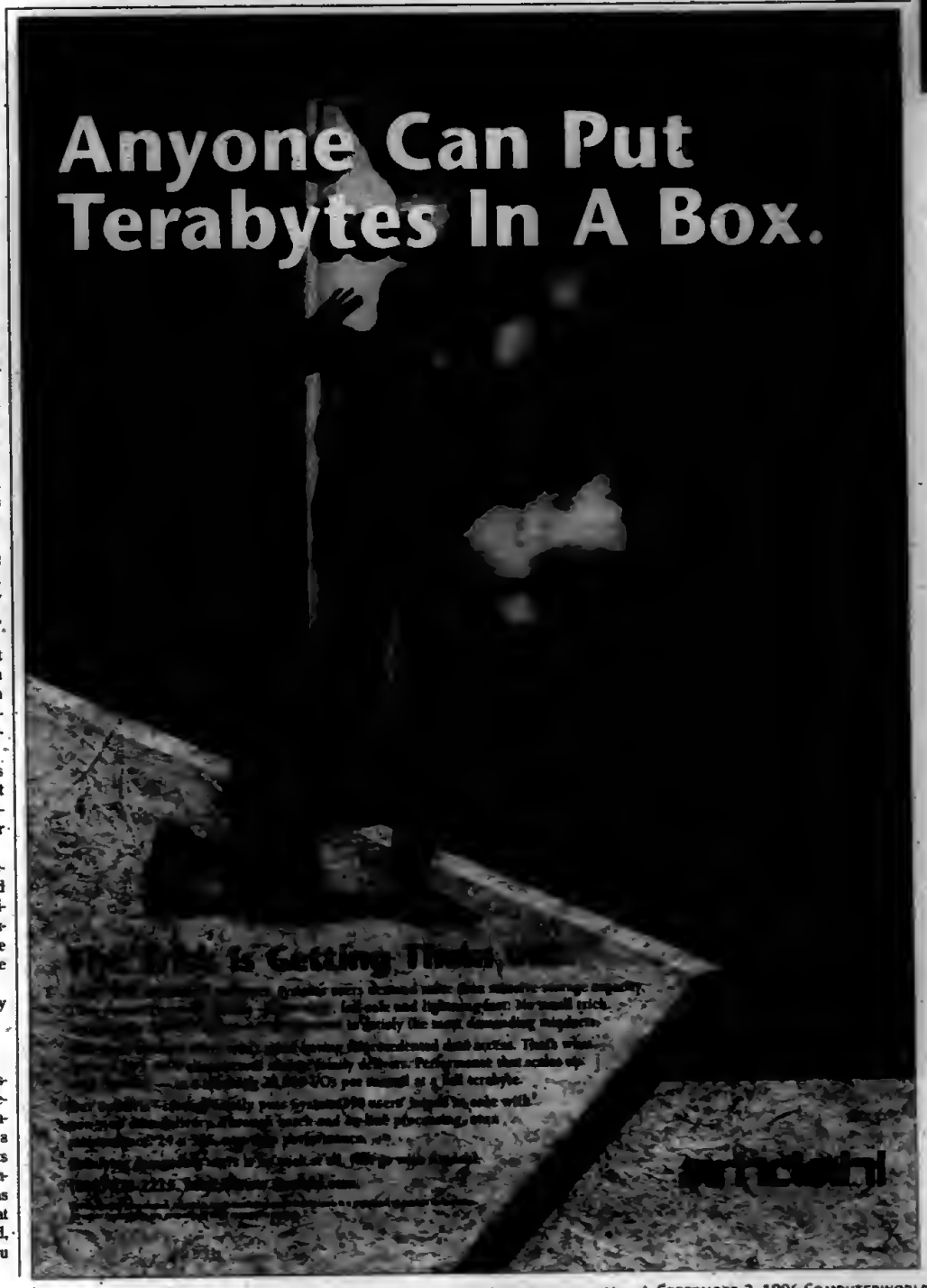
When he took over Novell, Frankenberg was saddled with several ill-conceived acquisitions that were made by his predecessor, Ray Noorda. During his tenure, Frankenberg sold off ancillary units, such as the WordPerfect applications business and the UnixWare group, to return Novell to its networking roots.

"He waded into the quagmire and drained the swamp," Harbison said.

But the pruning hasn't produced the desired results. Novell's recent financial results have been wobbly: Revenue fell 32% in its third quarter ended July 27, and profits dropped nearly 50% from year to year.

Frankenberg "didn't have a huge impact overall," said David Cearley, an analyst at Meta Group, Inc. in Stamford, Conn. "He moved very slowly."

Assistant sections editor Kevin Fagarty contributed to this story.



CA-World is a Unicenter universe

Company promises cluster option for Windows NT, Unix

By Bob Francis
and Thomas Hoffman
NEW ORLEANS

Users not dancing to the CA-Unicenter rhythm were left singing the blues at this year's CA-World user and developer conference.

It would have been easier to avoid gumbo and Cajun music than Computer Associates International, Inc.'s full-court press on CA-Unicenter, its market-leading systems management software.

"They seem to be pitching Unicenter at every opportunity," groused Peter Martin, vice president of information systems at Wells Fargo Bank in Phoenix. "We have several of their other products, and [those are] what we came here to see."

Other users echoed Martin's comments. "I came here to learn about Endevor [a CA change-management tool], but at the sessions even, they were talking about Unicenter," said an IS manager at an aerospace firm.

Users said CA offered sessions on those products and their future direction, but the sessions often seemed to be an afterthought. Paul Masoa, an analyst at International Data Corp. in Framingham, Mass., said that is because CA now sees CA-Unicenter as the key to the company's future.

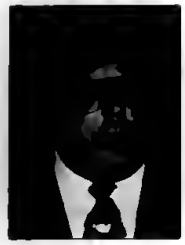
For those users singing the Unicenter tune, CA's announcements this week were right on key. Among the new Unicenter initiatives are the following:

- Integration with Intel Corp.'s LANDesk Server Management software.
- A development agreement with Tandem Computers, Inc. to develop management products for Windows NT clustered systems and Tandem's Unix-based parallel processing Himalaya systems.
- Unicenter links with Microsoft Corp.'s System Management Server that would allow CA's product to monitor and manage Windows NT servers.
- Adoption of HyperMedia Management Schema and HyperMedia Management Protocol for World Wide Web-based systems management, a recently proposed industry standard.

Eyes on the desktop

The major distributed systems management vendors are linking into key desktop management offerings

Vendor	Product	Strategy
Computer Associates International	CA-Unicenter: The Next Generation	Alliances with Microsoft, Intel and Tandem Computers to manage Windows NT servers and clusters.
IBM	Tivoli Management Environment (TME)	Tivoli TME 10/Plus connects LAN management products into TME.
Hewlett-Packard	OpenView	OpenView IT/Administrator for Workgroups provides connections to LANDesk and Microsoft's System Management Server.



Windows NT's scalability "is something we've been concerned about."

— Donovan L. Resh
Retired Persons Services

Scalability "is always an issue."

— Mike Altiero
American International Underwriters

An appealing promise

CA and Tandem's pledge to deliver by late next year a CA-Unicenter cluster option for Windows NT and leading Unix environments appealed to many attendees. The scalability on Windows NT is an issue for some as their organizations move mission-critical legacy applications to the Microsoft server platform.

Windows NT's scalability "is something we've been concerned about," said Donovan L. Resh, senior vice president and chief information officer at Retired Persons Services, Inc., an Alexandria, Va., prescription services group for members of the American Association of Retired Persons. The organization has been running more than 100 Windows NT servers for the past year.

Scalability "is always an issue" at American International Underwriters (AIU), where immense data warehouses consume considerable server resources, said Mike Altiero, manager of network services. AIU plans to use CA-Unicenter: The Next Generation to manage a global Windows NT network it will roll out this month.

Air-cooled

CONTINUED FROM PAGE 1

The rental car firm will still have to use two 10-processor air-cooled machines to replace one water-cooled box. But even so, Loane said he expects to save $400,000 per month on leasing and operating costs while making "a basketball court available on our computer room floor." Alamo plans to move its help desk into the open space and then set up a training center where the help desk is now, Loane added.

Meanwhile, for the lower end of the user scale, sources said IBM will release a series of stripped-down models with nearly 300G bytes of internal disk storage and a preconfigured operating system. Those are meant to look less like traditional mainframes and more like Unix servers but with the System/390's data-crunching power still intact.

The Enterprise Server G3 systems and Multiprise 2000 low-end boxes are being announced as part of a massive "Big Iron Day" rollout on Sept. 10 (see story at right).

Industry sources said the Enterprise Server G3, the third generation of IBM's air-cooled line, is based on a 42-MIPS processor that is twice as fast as its predecessor.

Paul Moseley

Alamo's Thomas Loane *says he hopes to cut monthly mainframe hardware costs by 25%*

The low-end Multiprise 2000 uses a slower 35-MIPS version of the CPU and supports only five processors, compared with 10 on the full-size boxes, sources said. The smaller boxes also don't support IBM's parallel sysplex technology for creating mainframe clusters.

For smaller shops that rely on creaky old mainframes such as the 3090, the Multiprise 2000 promises to be a prepackaged system that users "can just slide right into their networks and sort of think as a server," said Luther Perry, information services director for Santa Cruz County in California. "That way of doing business could really help some folks."

Shipments are scheduled to start Oct. 1. Amdahl also will release its first air-cooled boxes based on a 45-MIPS engine in October. Hitachi should follow with an air-cooled machine built around IBM's processor technology by year's end, sources said.

The competition should help push average prices down from $11,500 per MIPS to $10,000 per MIPS early next year, said Carl Greiner, an analyst at Meta Group, Inc. in Stamford, Conn. The pricing could get as low as $7,000 per MIPS by the end of next year, he forecast.

Alamo also looked at Amdahl's upcoming Millennium system, and IBM came through with "very aggressive price/performance" to win the order, Loane said. "I think it's a wonderfully competitive marketplace right now," he said.

The sequel: Ramac 3

IBM's Big Iron Day next week will include the introduction of the third generation of its Ramac mainframe array. The model doubles Ramac's capacity to 360G bytes and is supported by a spiffed-up version of the aging 3990 disk controller.

Ramac 3 should be "a good general-purpose disk array," although the 360G-byte limit is still relatively small compared with rival products, said Carl Greiner, an analyst at Meta Group. He added that IBM "is still a bit vague" on how Ramac fits with Storage Technology Corp.'s Iceberg and Kodiak arrays, which IBM resells.

The announcement is meant to show users that IBM isn't shutting off its disk research and development spigot in the wake of the June deal with StorageTek. Ironically, the Ramac line was supposed to end at the second generation until IBM ran into major delays on its futuristic Seastar storage family.

IBM also is announcing a long-promised mainframe version of its high-capacity Magstar tape drive. On the software side, the following products will be introduced:

- Web gateways to IBM's DB2 database and its CICS and IMS transaction software.
- A faster version of TCP/IP for the mainframe.
- Release 2 of the OS/390 operating system, which bundles MVS with Unix functions, systems management features and other supporting products [CW, Aug. 5].

— Michael Goldberg and Craig Stedman

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(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

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Has It Changed Your Life Yet?

Tech software speeds help desk searches

By April Jacobs

Inference Corp. is launching technical support software that uses the company's search engine and leverages databases from two other companies to speed up help desk response time.

Inference's two new software lines, Case Solutions and Reference Solutions, will work with the company's Case Point search engine to guide help desk staff to answers and build on existing knowledge bases. Companies can also use their own customized data sets with Inference's CBR engine, which can help avoid redundant searches for support questions.

Case Solutions for PC Diagnostics helps users look at about 1,000 common PC problems, ranging from adapter card, mouse and keyboard glitches to systems that have crashed or stalled. There is also a Case Solutions for Windows 95 and Windows NT. Additional "knowledge packs" developed by ServiceWare, Inc. and KnowledgeBroker, Inc. provide answers to another 20,000 support questions.

Paul Feicht, sales development manager at National Electronics Warranty Corp. in Sterling, Va., said his company already uses Inference's CBR technology and hopes to have the beta-test version of its Reference Solutions product up and running later this month.

National Electronics provides third-party warranty programs to retail giants, including Service Merchandise Co. and Kmart Corp., and to leading financial institutions. The firm fields more than 7,000 calls per day on a 24-hour, seven-day-per-week schedule.

"We service over 1 million customers and need to drill down to the problem they're having as quickly as possible," Feicht explained. "This will drive us more quickly to known failures."

Busy signal

Datequest estimates that some 200 million PC-related technical support calls will be made this year, at a projected cost of $3.9 billion. The San Jose, Calif., research firm also says 85% of users calling for help during peak business hours will encounter a busy signal on the first try.

Don Hinegardner personally fields more than 130 calls each day at National Electronics, working with the current system that supports PC-related issues. "Troubleshooting over the phone means we have to start from the beginning. This system is self-explanatory because it points you to the next step," he said.

Self-assessment

Companies looking into technical support software should evaluate their needs carefully before choosing a search engine, said Hugh Bishop, director of emerging technologies research at Aberdeen Group, Inc. in Boston.

He noted that Inference rival Software Artistry, Inc. also offers a search engine as well as call tracking software that allows technical support departments to review where problems are.

While the two offerings are similar, Bishop pointed out that Inference's CBR technology is typically used for more complex problems, where questions are open-ended and require a way to narrow possibilities effectively.

Case Solutions for PC Diagnostics and Windows 95 runs on Windows and Unix and is shipping at a list price of $195 for a single-user annual license. The Windows NT version is scheduled to ship in October. Reference Solutions will be available next month at a list price of $1,295 for a single-user annual license.

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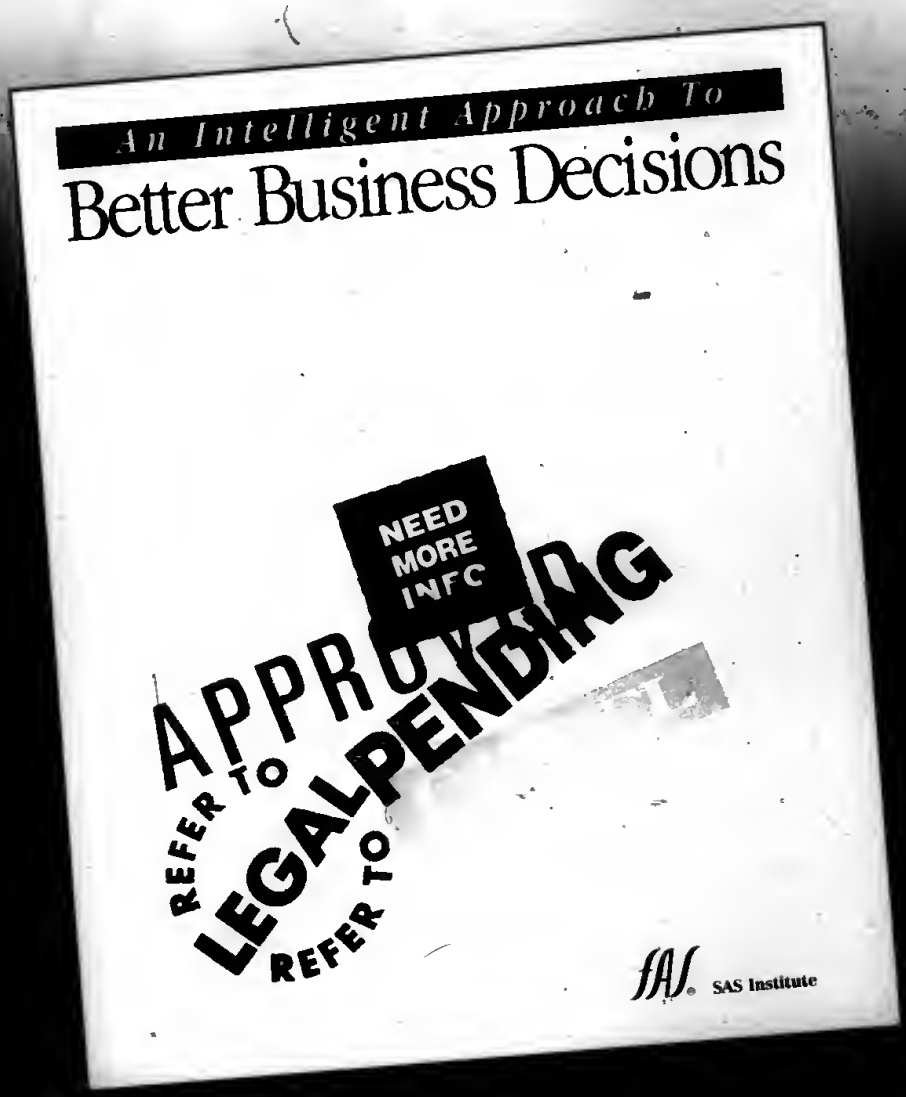

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Feds to track sex offenders with database

By Craig Stedman

Convicted sexual predators may be able to run, but soon they won't be able to hide — at least not from a database.

The U.S. Department of Justice, acting under a directive from President Clinton, last month completed plans for creating a computerized national registry of sex offenders by 1999. This is the latest example of a trend toward using "bad-guy" databases to track malfeasants of various stripes — from felons to quack doctors to deadbeat parents who don't pay child support.

An interim version of the sex offenders registry is scheduled to be in place within six months. It will cobble together separate state registries by adding pointers to them to entries in the FBI's mainframe-based criminal records database. A central file of sex offenders will be developed later as part of an overhaul of the FBI's system, due by mid-1999.

The final, centralized version of the database will make multiple state registries of convicted felons available directly from the FBI's system, which is being redesigned to run on an air-cooled parallel mainframe with IBM's DB2 relational database. The agency currently uses an older water-cooled mainframe from Amdahl Corp.

Like most of the bad-guy database efforts, the sex offenders project raises some concerns, even among people who generally support the idea of using computers to track potentially dangerous criminals after they return to society.

"Having the mark of Cain on you in cyberspace is not a pleasant thing," said Dean Kilpatrick, director of the National Crime Victims Research and Treatment Center in Charleston, S.C. Inaccurate data could lead to erroneous listings.

"But the fact that you don't have perfect data doesn't strike me as a reason not to do something," he said.

Even if the benefits of such a database to society outweigh the drawbacks, there are technical hurdles to overcome.

For example, James Polley, director of government affairs at the National District Attorneys Association in Alexandria, Va., said the technology available to prosecutors "runs the gamut from state-of-the-art stuff to quill pens and inkwells."

Police and prosecutors who connect to the FBI's database via SNA, TCP/IP and other network protocols will have to use a separate law enforcement telecommunications network to find more complete information about the criminals, such as mug shots, fingerprints and DNA samples.

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Electric exchange to buy, sell over 'net

By Mitch Wagner

Some 250 electric utilities that serve 32 states will throw the switch Nov. 1 on an Internet-based scheme for buying and selling electrical power nationwide.

As of that date, a marketing middleman in Pennsylvania, for instance, should be able to buy power from a generator in Amarillo, Texas, and arrange to sell that electricity to a factory in Mississippi. Such middlemen will represent electrical companies in various regions and independent retransmission companies.

But to make such a transaction work, the marketer would have to arrange for the use of electrical lines between Texas and Mississippi — and that is where the Internet comes in.

The Joint Transmission Services Information Network (JTSIN), which comprises most of the big electrical companies in the 32 states affected, will set up six World Wide Web servers nationwide linked to a database that lists the excess capacity available on power lines throughout the country.

Need a reservation

Marketers will be able to log in to the Web site and reserve capacity for their needs. Payments will be arranged off-line. The JTSIN predicts that $50 billion in transactions will be set up through the Web site in the first year of operation.

"It's analogous to the airline reservation system," said Jeff Geltz, manager of information services at New England Power Co. in Westboro, Mass., and a member of the JTSIN development committee. "A plane can hold a certain number of passengers, so you call the travel agent to contact the airlines to reserve space."

The purpose of the network is to increase choices for the ultimate buyers of electricity: businesses and consumers. "The government created this to encourage competition and create lower prices for consumers," said Barbara Connors, spokeswoman for the Federal Energy Regulatory Commission, which promulgated the regulations.

The Internet was selected over other options because it is cheap, ubiquitous and requires technology that is easy to install, maintain and use, Geltz said.

The network is being assembled by BSG Alliance/IT, Inc., Cegelec ESCA and TradeWave Corp. Security for the network will be based on a system of X.509 certificates from TradeWave.

Users will log in to a certificate server, receive a software data string called a certificate and use those certificates to log in to the other JTSIN servers on the network.

JTSIN will be a big test of the reliability of the Internet, which has been plagued by service outages due to the demands of growth. Geltz noted that communications among electric companies won't be time-critical — they can occasionally wait a few minutes or hours if a message can't get through.

"The reliability really relates to your choice of an Internet service provider," said Greg Cline, an analyst at Business Research Group. "To the extent that you've chosen a reliable [Internet service provider], the Internet would be fine for something like this."

Blackouts generating concern over deregulation of utilities

By Thomas Hoffman

Like many IS managers who work in the western U.S., Ruth Rowedder at Pentax Corp. said she hasn't given much thought to the blackouts that affected nine states last month.

Although Rowedder's home lost power for a few hours, the blackouts, triggered by sagging electrical lines in Oregon, occurred on a Saturday and never reached Pentax's computer facility in Englewood, Colo.

Unplugged

Power outages were responsible for 16% of all disasters that have been declared with Comdisco Disaster Recovery Services in Rosemont, Ill.

But the second major power outage in six weeks to the nation's largest regional power grid might be an early warning sign to Rowedder and other information systems managers to reassess their disaster recovery plans.

Although the blackouts themselves might not have been averted, industry experts said they believe that more effective communications between utilities and regulators could have minimized their impact.

Just the beginning

Several industry experts said they expect to see more frequent power disruptions across the U.S. in the next 10 years as utilities continue to slash costs, stretch their aging infrastructures and cut staff to remain competitive in the forthcoming deregulated market. Industrial customers who haven't already done so will need to invest in uninterruptible power supply systems and on-site generators to keep their systems humming, said Ken Brill, president of ComputerSite Engineering, Inc., a Santa Fe, N.M.-based disaster recovery consultancy.

"It's one of those 'down-in-the-bowels-of-the-building' kind of situations that won't get much attention until it happens a few times in different parts of the country," Brill said.

Associated Press Photo

Frankie Billalobos (left) and his brother Jose *peer into a closed Kmart store in Anaheim, Calif., during a major power outage Aug. 10 that hit the western U.S.*

Standing guard

Watchdog groups, such as the North American Electrical Reliability Council (NERC), which was formed after the 1965 blackouts in New York, have set up communications guidelines and operating practices among members. But Brill and other gurus said they believe most reliability issues in a deregulated industry are beyond NERC's scope.

As utilities slash their staffs to keep costs down, "they can't provide the serviceability they need to," said Pat Fisher, president of JANUS Associates, Inc., a Stamford, Conn.-based disaster recovery and security consultancy. She said the average company loses 2% to 3% of its gross annual sales after an eight-day computer outage.

Bill Hunter, a partner in the utility industry practice at Ernst & Young LLP in Houston, doesn't think the situation will stabilize on a national level until 2003. Federal legislation is expected to be introduced in 1997, and by 2003 most regions will have worked past any growing pains that deregulation may cause, Hunter said.

But in states such as California, where utilities are supposed to open the local distribution network to competitors in 1998, commercial customers should be able to receive uninterrupted power from a single vendor "without having to put in your own generators," Hunter said.

Ascend switch helps 'net access

By Kim Girard

Ascend Communications, Inc. tomorrow will roll out a high-capacity multiprotocol wide-area network access switch for Internet service providers and carriers that seek higher port density.

Ascend's Max TNT will help providers keep up with customer demand, offer multiple services on a single platform and support a variety of user needs.

The Max TNT supports 2,000 modems or 4,000 Integrated Services Digital Network (ISDN) B channels in an eight-foot rack — more than any other product competing in the high-end market, according to Ascend product manager Sunil Dhar. Competitors Nortel, Inc., U.S. Robotics Access Corp. and Cisco Systems, Inc. shouldn't be too far behind, said Liza Henderson, an analyst at TeleChoice, Inc. in Verona, N.J.

The Max TNT cuts space requirements because more modems can be packed in one unit. Customers will have fewer racks to manage and a lower cost per port. They also will be able to handle more users.

Orhan Onaran, president of Erol's Computer and Internet, an Internet service provider in Springfield, Va., said the switch will help his company penetrate new markets by cutting the time it takes to roll out services in new areas.

"It allows us to go into very large markets like New York, Boston and Chicago and use a minimum amount of space for lots of ports," he said.

A 14-in. Max TNT box can support 288 digital modems. The system can handle up to 672 connections for ISDN and modem calls, plus 150 frame-relay connections. The switch handles dial-up and dedicated traffic on one platform.

With a 35% boost in line density, customers should see fewer busy signals when they make phone calls or connect to the Internet, the vendor said.

Electric exchange to buy, sell over 'net

By Mitch Wagner

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So to all you adventurous types, sorry. Exabyte's new 8mm technology does push the limits of performance. But it's still the safest choice out there. For more on our 8mm tape products, or for a free Mammoth Facts Technical Paper, call 1-800-EXABYTE.

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Computer Industry

AltaVista IPO puzzles some

By Randy Weston

Digital Equipment Corp. is banking that Wall Street's hunger for Internet-related stocks isn't sated yet. The Maynard, Mass., company last week pitched a piece of its popular AltaVista search engine and related software in an initial public offering (IPO) valued at about $50 million.

But documents filed with the Securities and Exchange Commission last week included no pricing for the initial shares of AltaVista Internet Software, Inc. And Digital officials said the company plans to maintain control of 80% of the stock.

Fifth entry

If the IPO is approved, AltaVista will be the fifth search engine company to go public this year. But recent stock performances by the other companies left analysts perplexed by Digital's decision to put AltaVista on the block at this time.

"The problem is, not only did Internet search engines companies underperform, they underperformed at a time when technology stocks were taking off," said Ryan Jacobs, an analyst at IPO Value Monitor, a research firm in New York. "Now that technology stocks have settled in, will AltaVista take off? I doubt it."

Tiernan Ray, editor of "The Computer Letter," a newsletter published by investment research firm Technologic Partners in New York, said the software side of the business — not the search engine — is the key to the offering.

Recent IPOs from search engine companies

Company	Offering price	52-week high	Current price*
Lycos	$12-$14	$29.25	$7
Excite	$12-$14	$21.25	$5.87
Yahoo	$10-$12	$43	$21.12
Infoseek	$12	$16.50	$6.87

*As of Aug. 28

"It has just proved to be more of a successful software venture than had first been thought," Ray said. "It's also conceivable Digital wants to get more boost for its platform with a company out there that is quasi-independent [and is] writing stuff for Alpha [servers]."

Among AltaVista's software offerings are firewalls, virtual private networking software, Internet-based mail programs and World Wide Web conferencing software. Ray said AltaVista would increase its chances for success by not tying the software completely to Digital's servers and platforms. That is the direction Digital had been going in. "Everyone has always said AltaVista is great, but only if you have 20 Alpha stations pumping it out," he said. "It really is time to adapt it to other machines."

Digital officials wouldn't give a time line for the IPO, but said the approval process and market conditions will dictate when the stock is offered.

AST forces Diery's exit

By Jaikumar Vijayan

AST Research, Inc.'s search for Mr. Fix-it continues.

The battered PC maker's latest bid to find someone who can pull it out of its financial quagmire involved replacing CEO Ian Diery with Young-Soo Kim, a former executive at Samsung Electronics Co. in South Korea.

Samsung holds major equity in AST and owns or has options for 49.9% of AST's shares.

Diery's departure, after a brief 10-month stint at AST, comes shortly after the company announced its ninth successive losing quarter.

It was a hit-or-miss tenure for Diery, a former executive at Apple Computer, Inc. and Wang Laboratories, Inc. He was credited with AST's recent efforts to remake itself into a technology leader by being first to market with new PC boxes.

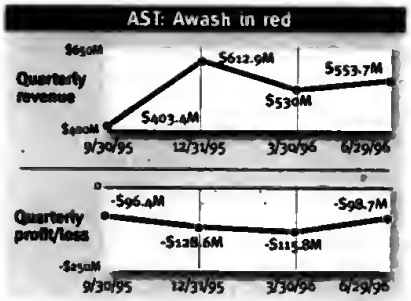
But his attempts to gain market share through aggressive low-margin pricing may have backfired, analysts said.

Ousted CEO Ian Diery *may have misfired with a low-margin pricing program*

"Diery should not have been focusing on being fastest to market with the lowest prices," said Joe Ferlazzo, an analyst at Technology Business Research, Inc. in Hampton, N.H.

"He should have tried to provide the most profit margin to the channel," he said. This would have given channel distributors greater incentive to push more AST boxes, Ferlazzo said.

"There isn't room among the first- and second-tier vendors for AST to compete on price anymore," said John Dunkle, president of Workgroup Strategic Services, Inc. in Portsmouth, N.H. Instead, Diery should have focused on high-margin differentiated products, he said.



A former PC heavyweight, AST is reeling under a string of successive losses that has seen the firm's sales and market share zigzag over the past nine quarters. In the last quarter, AST recorded losses of $98.7 million on revenue of $553.7 million. And unit shipments during the second quarter totaled approximately 321,000, down 19% from the same period last year.

In previous statements, the company has blamed intense PC pricing pressures and missed product deliveries for its current financial straits. Analysts also point to deteriorating channel relationships, lack of product differentiation and inconsistent marketing strategies. Efforts to reach Diery and AST officials for comment were unsuccessful.

Over the past two years, AST has tried several measures to stop the slide. These have included wrenching management shake-ups, stringent cost-cutting initiatives, shutting down some of its facilities and tinkering with its product mixes. But three CEOs, several senior executives and hundreds of laid-off jobs later, the magic formula still eludes AST.

Quarterdeck woes build: CEO resigns

By Stewart Deck

After 20 months at the helm, Gaston Bastiaens resigned last week as CEO of troubled Quarterdeck Corp. His resignation came on the heels of a third-quarter loss of $22.9 million and the layoff of more than 100 people, 11% of the company's workforce [CW, July 8].

While Quarterdeck searches for a new CEO, King Lee and Anatoly Tikhmao will share a temporary "office of the president."

In the year and a half since Bastiaens joined Quarterdeck, the Santa Monica, Calif.-based company spent more than $135.5 million to buy other companies and technologies and transform itself from a single Windows product company to a multiproduct vendor of Internet software.

"Gaston was a dynamic leader here," said Bob Kutnick, Quarterdeck's chief technology officer. He also said Bastiaens may have felt that "he had finished what he set out to do here."

Gaston Bastiaens *resigned after 20 months as CEO*

More likely, Bastiaens felt pressure to resign following the firm's negative financial jolt in July.

Not everyone buys Kutnick's explanation.

"I'm baffled by the timing of this because their turnaround isn't complete," said Chris Shiply, an analyst and publisher of "PC Letter" in San Mateo, Calif. The resignation "makes Quarterdeck look shaky" because Bastiaens had dramatically improved Quarterdeck's marketing and international sales channels and "aggressively refocused" the company, Shiply said.

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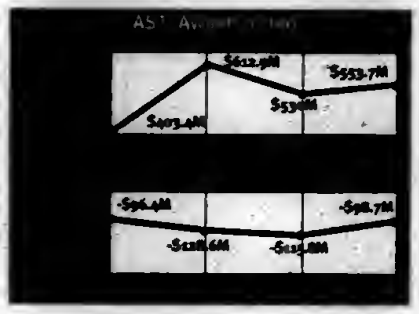

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Not everyone buys Kutnick's explanation.

"I'm baffled by the timing of this because their turnaround isn't complete," said Chris Shiply, an analyst and publisher of "PC Letter" in San Mateo, Calif. The resignation "makes Quarterdeck look shaky" because Bastiaens had dramatically improved Quarterdeck's marketing, and international sales channels and "aggressively refocused" the company, Shiply said.

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65. Communications Systems/Public Utilities/Transportation
70. Mining/Construction/Petroleum/Refining/Agriculture
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
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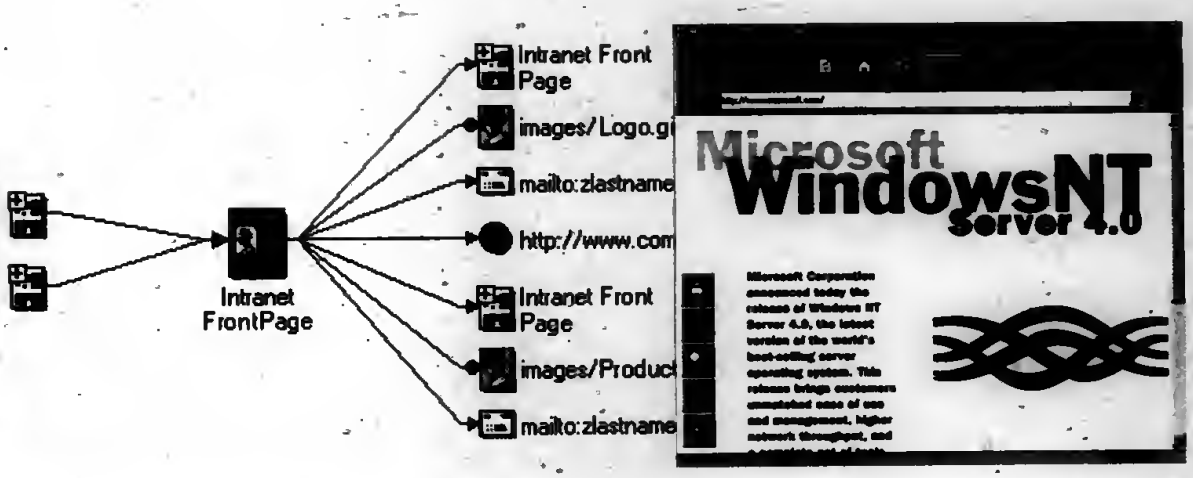

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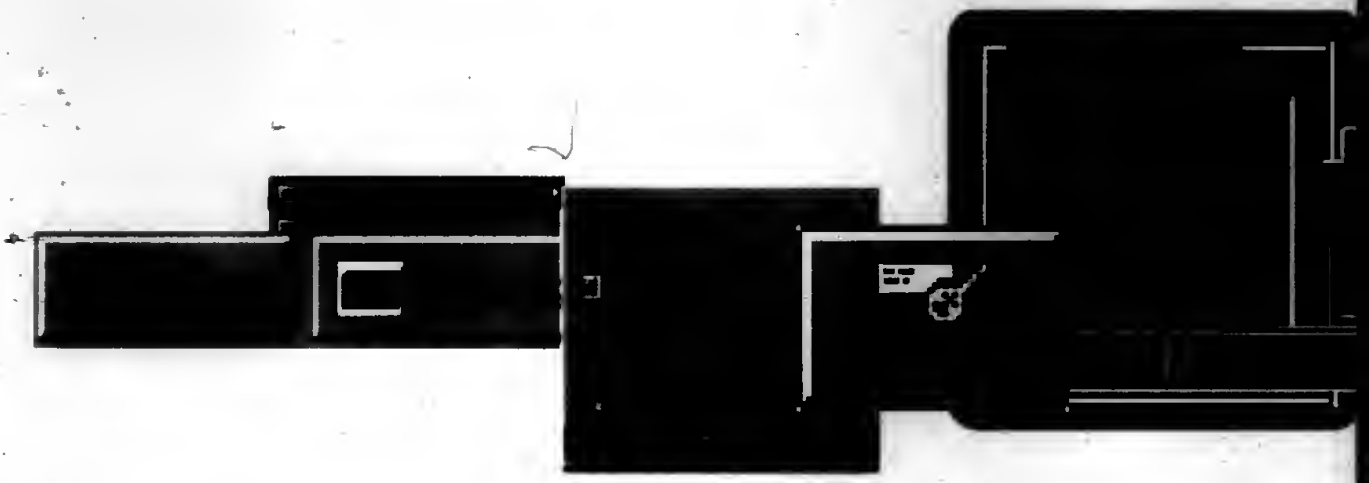

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Novell adrift

Bob Frankenberg's term as chairman of Novell proves that smart people don't always make great managers.

Frankenberg is one of the brightest people I've ever met, a well-read, worldly man who is as comfortable with philosophy as with technology.

But he was the wrong man for Novell, too dignified to take the offensive against Microsoft and too unwilling to fight back once his company was on the ropes. Unfortunately, it may be too late to undo the damage.

When Frankenberg took over two years ago, Novell was under pressure. Today, it is flat on its back. Novell is embarrassingly late in defining an Internet strategy. It is losing the marketing battle to Windows NT, although its market share is still strong. The company that used to promote itself so well today can't market its way out of a paper bag. It is so occupied with holding on to its existing customer base that it has failed to define any vision for the future. This proud company is adrift, directionless and, ultimately, probably acquisition bait.

It's pointless and unfair to pillory one man for a series of missteps that weren't entirely his fault. Novell's disastrous forays into Unix and office applications seriously damaged the company, and those didn't happen on Frankenberg's watch. The key question for customers is where they should go from here. It's increasingly difficult for corporate IS managers to justify continued NetWare investments to their bosses as Novell sinks into the horizon. Last week's news may only make that more difficult. The shame is that NetWare is technically a good product. But the rocketing success of NT makes it look more and more like a legacy system, with all the baggage that entails.

Novell must quickly take the offensive against NT. It needs to aggressively position itself as the company that was shipping network operating systems years before NT was even conceived. It should positioo the Internet as mere affirmation that network computing is a great concept. It needs to embrace the Internet Protocol, big time. It needs to hit this month's ship date for the Green River operating system update. Most of all, it should reassure corporate IS customers that the company has a strategy and a vision for extending network computing beyond the four walls of the corporation.

It's a tall order, and it requires a strong leader to carry it off. Novell has to find that persoo — and soon.

Paul Gillin, *editor*
Internet: *paul_gillin@cw.com*
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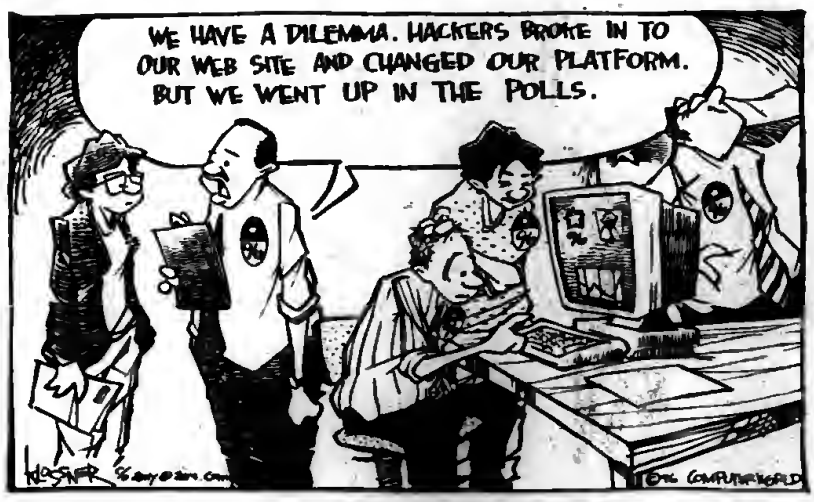

Thanks, but I'll keep my hard drive

In the Sun/Oracle/Netscape vision of the future, PCs (and their hard drives) would go away. People would use network computers without hard drives, and all the information we want would be stored in databases on [World Wide] Web servers that are controlled by someone else.

With my PC, the hard drive sits on my desk. I own it and control it, and the connection between the hard drive and the CPU is fast and reliable. PCs enhance the free flow of information in our society.

In order for hard-drive-less network computers to be feasible, a robust connection between hard drives and the CPUs would have to exist on a planetary scale.

If our ability to retain information oo local storage devices were limited, the freedom of information we all enjoy would be abridged.

Lyn Robison
Client/server Internet developer
Portland, Ore.

The King's English, please

I expect you know that you have many readers outside the U.S. What concerns me is the amount of slang used in your articles. Forgive my ignorance, but what is "a slam dunk," as in the "Internet" supplement [CW, July 29]?

The English language has been mauled about quite a lot on both sides of the Atlantic over the centuries, but it is still possible to communicate effectively using it.

Use of slang, as well as ill-defined technical terms — and worse, acronyms — to an excessive degree can only hinder the communication of ideas that is, I suppose, the very reason for Computerworld being published.

Kenneth Hobbs
West Sussex, U.K.

Expensive lessons

I continue to read articles such as "Errors haunt tape backup" [CW, Aug. 5] with contemptuous disbelief. In the fifth paragraph, Ed Graef is reported as saying that his [systems operators] must conduct lengthy searches of tape media to find files.

When are network operating systems going to include documentation of when and upon what media an object is backed up?

I know that the operating system of a very cost-effective platform — the IBM AS/400 — has the option of recording all information necessary to restore any edition of an object or of any set thereof.

It is high time companies recognize that this platform is far ahead of its competition in retaining operational data and that tape devices attached to an AS/400 running at 600M byte/sec. beat those puny 18M-byte/sec. units every day.

I suppose that one day OS/2 Warp Server, AIX and competing network operating systems will [give] the operator help that IBM mainframe and midrange operating systems do now. But one must wearily wonder why the same old lessons learned so long ago by legacy IS personnel must be relearned so expensively by LAN managers and administrators.

Michael G. Jones
Palm Harbor, Fla.

The CASE of the dreaded 'C' word

I read your article "CASE reincarnation" [CW, July 29] with much interest. I thought the CASE term was dead, with new and renamed tools living on.

I believe that the search for CASE-type tools may have limited your search for products, thus leading to some major tools not being listed.

For example, we use the GeneXus knowledge-based tool. It does all the functioos listed in your chart and more. However, GeneXus would oot have appeared in any CASE tool search. They shy away from the CASE label. The association with past failures is bad for marketing and sales.

I think the industry needs to come up with one acceptable "tool-aided design" category to classify all of the various tools.

I find it disheartening that people in our industry stop listening to what you are saying once the "C" word is brought up.

Treb Gatte
Winston-Salem, N.C.

■ Computerworld welcomes comments from its readers. Letters should not exceed 200 words and should be addressed to Paul Gillin, Editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

Verbatim

From a Computerworld Hong Kong interview with Dirk Gates, chairman, president and CEO of Xircom, Inc., a Silicon Valley vendor of LAN adapter and modem cards for notebook computers:

Q: Did you ever release a product that was just plain dumb?

A: Where we did the dumb thing was [with a] wireless LAN product. The technology we were using was a 1M bit/sec. technology.

What we found was the market just doesn't exist. The challenge was asking a broad, horizontal user population to take a tenfold decrease in performance for the ability to be highly mobile inside the office. And, oh, by the way, there was roughly a doubling of price.

"So, Mr. Customer, please spend twice as much to buy a wireless LAN adapter that communicates at one-tenth the speed, but you can move around in the office." That's been a challenge.

It's been exacerbated by the fact that [Xircom and other vendors are now telling] the market to go to 100M bit/sec. So the wireless technology is now 100 times too slow and two times as expensive as it should be.

From a report by Gregory Wester, a research director at The Yankee Group in Boston, about Internet service providers and Internet outages:

Over the next several years, millions of businesses and consumers will continue to experience loss of [Internet] service, slow transmission times, delays and high-speed bandwidth provisioning, billing mistakes and customer service incompetence.

The bad news is that customers will continue to have these problems; the good news is that this is a sign of pent-up demand. Over 20,000 businesses are at risk of experiencing significant service disruption over the next two years.

When the whole world is watching you

Jerrold M. Grochow

IS suddenly has to build user interfaces suitable for mass-market applications on the Web.

For most of their history, IS departments have developed systems for internal use — systems for order entry, inventory, accounting, you name it. Now these same IS departments are being called on to develop systems for external use — order entry, account review, application processing — to be used by you, me and everyone else.

Guess what? The world out there is different from the world in here.

Developing software for a few hundred customer service representatives on the next floor or in the next building isn't the same as developing mass-market software for (potentially) millions of people you will never meet. Corporate IS departments that build Internet and World Wide Web offerings are venturing into an arena that had been the province of big names such as Microsoft and Lotus.

Everyone better figure out pretty quickly how to perform in this highly public arena or be prepared to be eaten by the lions.

The major issue is usability. Reliability and performance are important, too, but these are factors that most IS departments grapple with all the time. In the world of telephone call centers, for example, customer service representatives get systems that are responsive and up all the time (well, almost all the time). Usability is also important to these internal end users, but their view of usability is fairly different from that of Josephine Q. Consumer.

You've heard the joke about what automobiles would be like if they were developed by the designers of DOS: We'd have to type DRV on little keyboards to go forward and RVRS to go back. And sometimes the car wouldn't do anything anyway, and we'd have to shut it off and restart. Well, the differences between developing systems for small numbers of highly trained professionals vs. millions of consumers are almost that dramatic.

What you guess will be user-friendly and what really is user-friendly are two different things. I've shown "well-designed" graphical user interfaces (GUI) to managers who loved them and then heard the real end users gripe about how the so-called "easy-to-use" interfaces slow down their work. They didn't want GUIs with lots of small windows and pull-down menus. They wanted everything crammed in to one window so that they didn't have to switch back and forth and take their hands off the keyboard.

Usability is in the eye of the beholder — and you better look the real user in the eye to find out what it is that she beholds. The process of defining usability criteria, designing to meet those criteria, prototyping and then testing with the target audience is just as important as getting the code right.

Yet these tasks require training and skills that few people in IS departments have. One way or another, we have to get people with the right skills to deliver the application interfaces that our new, external end users are going to demand.

This means we need people who understand the needs of different classes of consumers, from those with slow or text-only Internet access to those with cable modems and flashy browser plug-ins. It means we need people who cast a critical eye on useless widgets, confusing navigation schemes, maddening error messages and ambiguous button labels. It means we need people who think about all the possible human factors that will make your Web-based applications usable by your newest users.

Grochow is chief technology officer at American Management Systems, Inc. in Fairfax, Va. His Internet address is jerry_grochow@amsinc.com.

High-tech silliness never ends

John Gantz

After 22 years, today's debates about ISDN, applets and thin clients sound terribly familiar.

As the fall Comdex season approaches, another anniversary of my life as an analyst ticks by. It makes me think back, back into the swirling mists of antiquity, when computers existed on a diet of punched cards, and computer memories were made of iron doughnuts smaller than Cheerios.

When I began life as an analyst at International Data Corp. 22 years ago, there were only 100,000 remote connections to all the computers in the world. And anyone hooked up that way knew the difference between a baud and a bit/sec. IBM reigned supreme, and Bill Gates hadn't entered Harvard yet, much less dropped out. A lot has happened since then, including a lot of misguided efforts. Some of my favorites include the following:

- The IBM 3850 Mass Memory system, a room-size beehive of tape cartridges plucked by a robot arm to a special player. It didn't work very well — the robot arm kept jamming — and few data center managers wanted to pay seven figures for the opportunity to buy the strange little tape cartridges made only by IBM.
- The Xerox XTen Network, which — years before cellular telephones were invented — proposed to send data signals via satellite to local towers from which they would be broadcast directly to computers. The XTen Network never made it past the drawing board, but it gave AT&T a fright and my career a boost. I used to make speeches and write articles about the threat to Ma Bell posed by Xerox and IBM's satellite network.
- The Data General Nova 16-bit computer-on-a-chip, which was nothing special, really, just a minicomputer on a chip. But DG set a new standard in cheesiness when, at a National Computer Conference, it hired a belly dancer to wear the chip in her navel while dancing in front of a crowd of data processing managers who were let out of their glass-walled cages once a year.
- The year 2000 date-conversion problem. Back in the 1970s, it received a ton of attention, particularly when there was no news on the interminable and numerous IBM antitrust trials. The general consensus was that, with 25 years to go before the problem hit, the industry would surely solve the problem in plenty of time.

There are lots more, of course: bubble memory computers, 16 brands of IBM clones that disappeared in 1983, chips made of sapphire, PBX/computer combos, the voice/data terminal, AT&T's videophone (millions would be sold!) and the entire science of artificial intelligence.

This history is the lens through which I look at the debates that surely will swirl about Comdex this fall. Will cable modems make ISDN obsolete? Isn't it already? Weren't diskless PCs the rage a decade ago? Will Java applets replace monolithic programs? Wasn't reusable software supposed to do that? Will next-generation databases support voice and video along with data? Gee, didn't Computer Corporation of America's Model 204 do that a decade ago? Will Microsoft's Cairo ever ship? I dunno — will IBM's user System Q ever ship? Back in the late 1970s, it was supposed to revamp user interfaces and operating systems at the same time.

You see, when I make my rounds at Comdex, I'll be viewing the current debates and themes in a context that includes some truly bizarre products, technology back alleys and nutcase entrepreneurs. I only hope I get to see that belly dancing thing again. It's been decades.

Gantz is a senior vice president at International Data Corp. in Framingham, Mass. His Internet address is jgantz@idcresearch.com.

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A blizzard of new mobile devices has hit the market, 44

Servers & PCs

R. Warren Wurts

Thinking of consolidating your data centers? Zurich Insurance's Douglas Mackie says the challenge is to justify...

BIG SHOPS FOR BIG IRON

By Michael Goldberg
SCHAUMBURG, ILL.

Insourcer: That's the role the American division of Swiss conglomerate Zurich Insurance Group picked for its suburban Chicago data center in 1993 as it faced up to rising demands from a growing list of subsidiaries.

"There are economies of scale to running one data center instead of four," said Douglas Mackie, vice president of operations at what Zurich calls its megacenter.

Mackie said Zurich is no foe of outsourcing — for example, it has hired Advantis to run its wide-area networks. But by creating a megacenter for Zurich's American business units, it can control all its big iron in one shop and seek to eliminate redundant software.

Just as important is a planned "logical" consolidation of its information systems, with a standard set of software applications across its user companies, he said. Those standards are still being chosen and evaluated.

Although he declined to specify the amount of money saved at this point, Mackie said he expects the savings to amount to roughly $19 million over several years. That will stem mostly from negotiated reductions in software license fees and lower hardware maintenance costs.

All told, the megacenter serves several thousand users. It covers Zurich-American Insurance, based here; Universal Underwriters Insurance Co. in Overland Park, Kan.; and two Baltimore-based firms, Fidelity and Deposit Insurance and Maryland Commercial Insurance.

One of the world's biggest insurers, Zurich has long run a European megacenter.

Beyond the $19 million in projected savings, other economic benefits are expected from plans to automate the companies' tape libraries with tape silos from Storage Technology Corp., Mackie said. In the past two years, the center's staff has grown from 72 to 111 as it has doubled its processing capability.

Yet as a veteran of data center consolidations at the former Nabisco Cos. and at The Chase Manhattan Bank Corp., Mackie knew there would be ongoing challenges — one of the biggest being to justify his own job. "We've got to get better at business planning and usage analysis, so we can show our" subsidiaries the value of the megacenter vs. separate mainframe shops, he explained.

Megacenter move

It took about a year to plan the physical consolidation of four mainframe-heavy data centers and another four months to carry it out during the summer of 1994. The staff jetted copies of insurance data on disk drives to Chicago and duplicated the System/390 hardware that was in Kansas and Maryland. That happened while the center continued to process a daily average of 1.8 million transactions.

The early days of the megacenter produced the most glitches, as IS managers sought to maintain constant levels of uptime, said Eileen Strider, vice president of information services at Universal Underwriters Insurance.

IBM looks to take adventure out of parallel processing

By Craig Stedman

IBM is trying to develop a better fit between its Unix parallel processor and commercial users who don't long for the challenges that parallel technology can pose.

The computer giant starting next week plans a series of enhancements that are aimed at making its RS/6000 SP system less daunting and more useful to mainstream users.

RS/6000

Commercial focus

After it initially launched the RS/6000 SP as a technical processor for scientists and researchers, IBM is focusing more and more on commercial shops.

Parallel systems such as the RS/6000 SP can support many more processors than symmetrical multiprocessors.

That enables customers to run multiple transaction processing and data warehousing applications on one box, with high-speed communications links connecting applications to each other.

But the trade-off is added complexity.

IBM plans to pretest configurations that integrate the RS/6000 SP with stacks of IBM and third-party software, such as databases and transaction monitors.

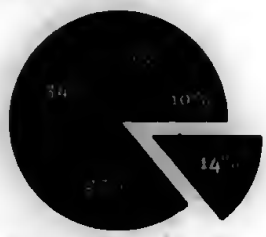
Although IBM doesn't plan to sell its configurations as ready-to-go systems, customers could use them as guides for doing SP implementations rather than starting at ground zero with a box and nothing else.

IBM's integration plans could help users by masking the quirks that set the RS/6000 SP apart from general-purpose RS/6000 Unix servers, such as special programming requirements for clustering, said Alan Dorais, manager of server technologies at Chesebrough-Ponds USA in Trumbull, Conn.

"It would make me feel a lot more comfortable that they've at least taken the time to make sure things work," Dorais said. "Whenever they do any sort of legwork for you, it helps." Chesebrough-Ponds, a maker of personal care products, runs an inventory management application on the RS/6000 SP and plans to do plant scheduling work on it starting next month.

Room to grow for IBM

Worldwide 1995 market share for high-end commercial parallel processors, by revenue



Total revenue: $1.54 billion

Tandem
Sequent
NCR
Others
IBM

Source: Study Group, Inc., Minneapolis

IBM next Monday will announce a new center for testing large-scale data warehouses that the RS/6000 unit will share with IBM's mainframe and AS/400 divisions, IBM officials said at an SP-related briefing in Boston last week.

More SP-specific integration work will start in the fourth quarter for decision-support and transaction-processing uses.

More to come

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- Support for clustering RS/6000 SP nodes across distances of up to 1,500 miles. That would let customers create hot backup sites that should provide "almost transparent" switchovers if a system failed, said David Audley, director of investment systems and services at Tiger Management LLC in New York.
- A new clustering technology, code-named Phoenix, that would increase the number of SP nodes that could be linked together from eight to 32.
- A gateway router that could feed up to 16 streams of external data into an SP.

A blizzard of new mobile devices has hit the market. 44

Servers PCs

Douglas Mackie *has overseen the data center consolidation at Zurich Insurance Group*

Thinking of consolidating your data centers? Zurich Insurance's Douglas Mackie says the challenge is to justify . . .

BIG SHOPS FOR BIG IRON

By Michael Goldberg
SCHAUMBURG, ILL.

Insourcer. That's the role the American division of Swiss conglomerate Zurich Insurance Group picked for its suburban Chicago data center in 1993 as it faced up to rising demands from a growing list of subsidiaries.

"There are economies of scale to running one data center instead of four," said Douglas Mackie, vice president of operations at what Zurich calls its megacenter.

Mackie said Zurich is no foe of outsourcing — for example, it has hired Advantis to run its wide-area networks. But by creating a megacenter for Zurich's American business units, it can control all its big iron in one shop and seek to eliminate redundant software.

Just as important is a planned "logical" consolidation of its information systems, with a standard set of software applications across its user companies, he said. Those standards are still being chosen and evaluated.

Although he declined to specify the amount of money saved at this point, Mackie said he expects the savings to amount to roughly $19 million over several years. That will stem mostly from negotiated reductions in software license fees and lower hardware maintenance costs.

All told, the megacenter serves several thousand users. It covers Zurich-American Insurance, based here; Universal Underwriters Insurance Co. in Overland Park, Kan.; and two Baltimore-based firms, Fidelity and Deposit Insurance and Maryland Commercial Insurance.

One of the world's biggest insurers, Zurich has long run a European megacenter.

Beyond the $19-million in projected savings, other economic benefits are expected from plans to automate the companies' tape libraries with tape silos from Storage Technology Corp., Mackie said. In the past two years, the center's staff has grown from 72 to 111 as it has doubled its processing capability.

Yet as a veteran of data center consolidations at the former Nabisco Cos. and at The Chase Manhattan Bank Corp., Mackie knew there would be ongoing challenges — one of the biggest being to justify his own job. "We've got to get better at business planning and usage analysis, so we can show our subsidiaries the value of the megacenter vs. separate mainframe shops," he explained.

Megacenter move

It took about a year to plan the physical consolidation of four mainframe-heavy data centers and another four months to carry it out during the summer of 1994. The staff jetted copies of insurance data on disk drives to Chicago and duplicated the System/390 hardware that was in Kansas and Maryland. That happened while the center continued to process a daily average of 1.8 million transactions.

The early days of the megacenter produced the most glitches, as IS managers sought to maintain constant levels of uptime, said Eileen Strider, vice president of information services at Universal Underwriters Insurance.

IBM looks to take adventure out of parallel processing

By Craig Stedman

IBM is trying to develop a better fit between its Unix parallel processor and commercial users who don't long for the challenges that parallel technology can pose.

The computer giant starting next week plans a series of enhancements that are aimed at making its RS/6000 SP system less daunting and more useful to mainstream users.

RS/6000

Commercial focus

After it initially launched the RS/6000 SP as a technical processor for scientists and researchers, IBM is focusing more and more on commercial shops.

Parallel systems such as the RS/6000 SP can support many more processors than symmetrical multiprocessors.

That enables customers to run multiple transaction processing and data warehousing applications on one box, with high-speed communications links connecting applications to each other.

But the trade-off is added complexity.

IBM plans to pretest configurations that integrate the RS/6000 SP with stacks of IBM and third-party software, such as databases and transaction monitors.

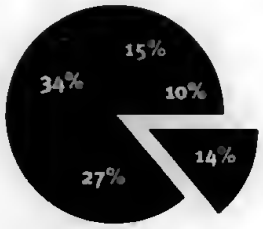
Although IBM doesn't plan to sell its configurations as ready-to-go systems, customers could use them as guides for doing SP implementations rather than starting at ground zero with a box and nothing else.

IBM's integration plans could help users by masking the quirks that set the RS/6000 SP apart from general-purpose RS/6000 Unix servers, such as special programming requirements for clustering, said Alan Dorais, manager of server technologies at Chesebrough-Ponds USA in Trumbull, Conn.

"It would make me feel a lot more comfortable that they've at least taken the time to make sure things work," Dorais said. "Whenever they do any sort of legwork for you, it helps." Chesebrough-Ponds, a maker of personal care products, runs an inventory management application on the RS/6000 SP and plans to do plant scheduling work on it starting next month.

Room to grow for IBM

Worldwide 1995 market share for high-end commercial parallel processors, by revenue



Total revenue: $1.54 billion

Tandem, Sequent, NCR, Others, IBM

Source: Strategy Group, Inc., Minneapolis

IBM next Monday will announce a new center for testing large-scale data warehouses that the RS/6000 unit will share with IBM's mainframe and AS/400 divisions, IBM officials said at an SP-related briefing in Boston last week.

More SP-specific integration work will start in the fourth quarter for decision-support and transaction-processing uses.

More to come

To further cozy up to commercial shops, IBM also plans to introduce the following SP-related products this fall:

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Laptop, mobile markets heat up

By Mindy Blodgett

As demand in the mobile market exploded this year, a blizzard of new laptops and mobile devices hit the market.

The competition is good news for users, who saw prices fall for laptops, personal digital assistants and other mobile products. Although the summer has seen a slowdown, there were some recent releases.

Kalidor, a division of ALPS Electric (USA), Inc. in San Jose, Calif., released pen-based computers designed for heavy-duty outdoor use. Two models are available, one with two Type II PC card slots and the other with one Type III PC card slot. Both run on 100-MHz 486 chips from Advanced Micro Devices, Inc. and come with Windows 3.1 or Windows 95 preinstalled. Prices range from $4,495 to $4,995.

The K2500 line is aimed at users who collect data in the field, including utility companies and law enforcement agencies.

Barry Hillman, president of Condor, Inc. in Sonora, Calif., a geographic information system and mapping software firm, said his employees use the device in the field to create maps in all sorts of conditions.

"We have used a wide variety of ruggedized computers, but this has been the most stable unit," he said. "We haven't had failures as a result of the computer being dropped. That's important because sometimes you're in a remote area, and it's going to be hours before you are out of the field."

The K2500 weighs 3.7 pounds with battery. It can withstand 95% humidity and temperatures up to 122 degrees Fahrenheit.

Kalidor K2500 features

[redacted]

Rockwell Trekker features

[redacted]

Other recent mobile device releases include the following:

- The PC-9090 notebook from Sharp Electronics Corp. in Mahwah, N.J., with a 150-MHz Intel Corp. Pentium processor. The system has a 1.8G-byte hard disk drive, a 12.1-in. active-matrix screen, a lithium ion battery and infrared technology that lets users wirelessly connect to a LAN. It weighs 7.3 pounds. Pricing isn't available.
- Rockwell International Corp. in Cedar Rapids, Iowa, has introduced the Trekker, a small, rugged, voice-controlled mobile computer. Users can wear the system on a belt or shoulder strap. The VGA display is a small screen attached to a headband near the eyes. A headset microphone is also attached. A mouse connected to the keyboard can be manipulated by hand, which lets users record information without taking attention away from other tasks.

The Trekker has a Windows operating system and weighs about 6 pounds with battery. Pricing starts at $10,000.

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New libraries are finally letting Java developers write serious business applications on the Web, 48

Software

DEC shows Affinity for NT

By Jaikumar Vijayan

Digital Equipment Corp. is set to announce over the next few weeks products designed to ease migration from OpenVMS to Microsoft Corp.'s Windows NT Server.

The products are part of Digital's 15-month-old Affinity program, under which the company has been developing a range of integration and development tools that integrate Windows NT with proprietary OpenVMS environments.

The next wave of products will plug gaps in cross-platform systems management and enterprise messaging.

The short-term goal of these products is to let corporations host most of their large applications on OpenVMS servers and tap Windows NT applications and servers for departmental and workgroup applications. Long term, the focus is on migrating users completely away from OpenVMS to Windows NT.

"It is a great marriage," said Mark Joyce, a supervisor at the Corning Telecommunications Division of Corning, Inc. in Wilmington, N.C.

"Windows NT has a lot of good things, but it certainly isn't at the point of being an industrial-strength operating system that you can bet your business on," Joyce said.

Digital's Affinity program: One year later

- **What it is:** A strategy to develop products to integrate OpenVMS and Windows NT
- **What has been announced:** Transaction processing software, client/server tools, systems management software, World Wide Web hosting, enterprise messaging and application development tools for integrating Open VMS and Windows NT
- **What is coming:** Expanded program for Windows NT/Unix integration

Corning runs its database applications on OpenVMS servers in a three-tier environment that hosts several lower-end applications on Windows NT clients and servers.

OpenVMS is one of Digital's earliest operating systems and was originally developed for the company's VAX server platforms.

The flow of applications that run on OpenVMS has been drying up rapidly in the past few years as software vendors turned to more open and lucrative operating system environments such as Windows NT. This has left a small but growing segment of the OpenVMS base uneasy about the future.

Affinity "has basically provided a lot of VMS users the kind of safety net they needed to continue with OpenVMS," said Chris Christiansen, an analyst at International Data Corp. in Framingham, Mass.

"People are less likely to migrate out [from Open VMS environments] now that they have this increased level of interoperability with Windows NT," said Michael Goulde, an analyst at Patricia Seybold Group in Boston.

DBExpert provides basic OS/2 database functions

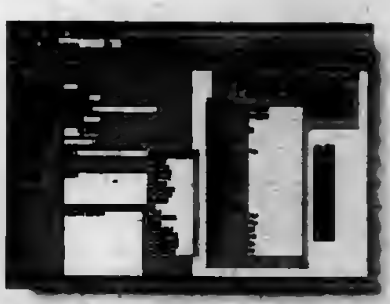
By Esther Schindler

Designer Software, Inc.'s DBExpert 2.02 is an end-user relational database for OS/2.

It is suited for the myriad ordinary data-collection and data-management tasks that don't require a database that can leap tall buildings in a single bound. If you need to manage customer databases, parts lists or department inventories, DBExpert might be the tool for you.

DBExpert supports databases in dBase IV, DB2/2, Oracle and SQL formats. Because DBExpert works with files in a number of formats, you can use it as a front end for a DB/2 or Oracle database on OS/2, AS/400 or

DBExpert, *page 46*



***DBExpert** can create a quick form with just a few mouse clicks, but it provides a rich feature set for customizing appearance and behavior*

Software delivers customized PC orders, tracking

By Julia King

Some burger buyers want pickles but on lettuce. And some corporate customers want different kinds of PCs for different users.

Then there's locale to consider. Some buyers want their PCs shipped to different sites in different states but listed on one invoice sent somewhere else. Others want to electronically track the status of shipments as they roll along the interstates.

How to manage such a nightmare of complexity? With a relatively new category of packaged software known as integrated response systems. Such systems enable Unisys Corp. and other manufacturers to give thousands of customers exactly what they want, when they want it — and all at different prices.

"I can take an order from a post office that wants a certain workstation configuration delivered to 20,000 addresses," said Tim Mitchell, director of order management information systems at Unisys in Blue Bell, Pa.

Building the computers is the easy part. Where it gets complicated, Mitchell said, is keeping track of the tens of thousands of order permutations and adjusting inventory levels and available-to-promise schedules accordingly.

To do that, Unisys' $1 billion PC division is in the process of a $10 million project to implement Unix-based demand management software from Industri-Matematik International Corp. (IMI) in Tarrytown, N.Y.

The ESS System, which starts at $600,000, is an integrated response system. Typically installed as a front end to proprietary manufacturing systems and enterprise packages from SAP AG, Oracle Corp. and others, such systems let companies customize orders rather than take a one-size-fits-all approach with all customers.

Officials at Campbell Soup Co. in Camden, N.J., expect to save $18 million under the company's new Compass customer-service system. The system uses IMI's ESS System software to integrate customer orders for Campbell products, including Prego sauces, Pepperidge Farm cookies and crackers and Godiva chocolates.

More support

What is new in the latest version of IMI's ESS System software is support for more order classes and support for menu pricing.

The latter lets manufacturers give customers a base product price as well as a list of optional enhanced services — such as express shipping — and their associated prices. Customers can choose the features and services they want while keeping a running total of charges.

"Manufacturers are, more and more,

Software, *page 48*

DBExpert provides basic OS/2 database functions

CONTINUED FROM PAGE 45

MVS environments.

Queries use the by-now-familiar graphical query-by-example (QBE) methodology; if you have used QBE elsewhere, you won't find any surprises. One DBExpert benefit, however, is its ability to examine or change the SQL commands that make up a query. If you know what you're doing with SQL, DBExpert won't get in your way.

To join tables, you associate columns using drag-and-drop. Data-entry forms can be created from tables or queries with a few mouse clicks, but more adept users can take advantage of controls that include event triggers, list boxes and buttons, graphics and multiple-table joins. Reporting functions are excellent; the default "Quick report" makes it easy to create an attractive, readable report.

If your database outgrows the functions that DBExpert can provide and you decide to "move up" to a larger system, you can change the database's format with one mouse click. Change the database type from, say, dBase IV to DB2/2, and the program will rewrite the files in the correct format.

DBExpert uses the powerful Rexx language for its macro language. Rexx is included with OS/2 and thus is familiar to most users. DBExpert uses the Workplace Shell to its advantage. The program is organized with notebooks, and it uses drag-and-drop in a manner natural to OS/2 users.

The program's greatest strength is its ease of use, particularly for users new to databases who don't want to become database gurus. The tutorial patiently explains basic concepts so that a novice can be up and working in a short time. If your database needs are simple, DBExpert might make you very happy.

Unfortunately, DBExpert is far from perfect. One really irksome problem was DBExpert's propensity for sucking up CPU cycles like they were licorice. It made doing *anything* else on my system slow. Some database queries with dBase databases took so long that I believed the program had hung. A few times, while it was locked in one of its CPU-intensive conversations with itself, the only way I could kill it was to shoot it with PM Patrol, an OS/2 utility from Wallyware.

Not stable enough

I also found a few stability problems. For instance, I ran headlong into a bug in ASCII file import. Designer Software knew about the bug and had been working on it for several weeks. Company representatives used my data to determine that their fix worked and provided an update immediately.

I would like some features to be enhanced further. For instance, to design a form or report that accesses another table, you are required to type in the column number from the table in question. I would prefer to type in the column name or, ideally, choose from a drop-down list.

DBExpert probably won't make you crow with glee. It has some frustrating shortcomings that prevent a wholehearted recommendation. Yet I find I like it, and I expect to use it for modest database projects. It won't be deleted from my hard disk anytime soon. DBExpert's good features are good enough that, assuming Designer Software can smooth its rough edges, this could grow into a fine end-user database indeed.

Schindler is senior contributing editor at *OS/2 Magazine*, co-author of *Teach Yourself Rexx in 21 Days* and author of *The Computer Speech Book*. You can reach her at esther@primenet.com.

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Application Development

Vendors boost Java support, aim for enterprise

By Frank Hayes

The pieces are finally falling into place to let corporate developers use Java to build serious business applications on the World Wide Web.

Last month, for example, IBM announced that a large collection of its development libraries will be rewritten in Java, Sun Microsystems, Inc.'s Internet development language. The libraries, which are collections of commonly used Java code, include user-interface components from IBM's Taligent subsidiary and business frameworks from its project code-named San Francisco. Together, they should make it much easier for Java developers to use that language for more than just pretty Web pages.

Sore spot

The lack of Java libraries for building server applications has irritated early Java users.

"In the future, Java might be usable on servers, but right now it's all at the front end. We have to write our servers in C++ and C — the standard traditional way," said Mark Rhoads, vice president of software engineering at Information Presentation Technologies, Inc. in San Luis Obispo, Calif., which is developing Java applications for the printing business.

As a result, client/server Java developers must juggle two programming languages and lose Java's ability to run without change on a variety of platforms.

By throwing its support — and code — behind Java, IBM joined forces with Sun and Netscape Communications Corp to add some enterprise-class muscle to Web applications. That lets corporate Java developers do transaction processing and other common client/server actions across the Internet.

Earlier in August, Netscape announced that future versions of its Navigator browser and SuiteSpot server will let applications create a secure, reliable Web data pipeline based on the Object Management Group's Common Object Request Broker Architecture (CORBA). And IBM and Sun said they would work together to ensure that their CORBA-based communication systems could interoperate. IBM will create Java links to its MQSeries middleware and CICS transaction system.

Those moves will give the Web the infrastructure it needs to build serious client/server applications, users said. "If you want the Web client to talk to the Web server, there are not a lot of communication facilities available right now," said Alok Garg, senior consultant at Cap Gemini America in Iselin, N.J.

But it's the added libraries that will fill the most apparent need, Java developers said. Although companies such as Rogue Wave Software, Inc. in Corvallis, Ore., and KL Group, Inc. in Toronto have converted some of their C++ libraries to Java, the language has lacked full-scale application frameworks available for other languages, such as the C++ Microsoft Foundation Class libraries from Microsoft Corp.

Instead, Java developers must work around important capabilities that are simply missing, said Doug Garrett, president of AnetSc, a Java developer in Fremont, Calif. "It's a matter of how fast you'll be able to develop and deliver something," Garrett said.

"Right now, Java still lacks libraries for a lot of functionality that's available in C++," Garg said. "If IBM provides the kind of functionality that is already there in C++ and other languages, I don't think Java might need a lot of other help."

Java comes together

How things work

- Basic Java libraries ship from Sun and third parties
- Web applications use CGI scripts to link to back-end processes

How vendors are acting

- IBM and Sun will port Taligent and San Francisco libraries to Java
- IBM and Sun will link Java with CICS transaction processing and MQSeries and CORBA middleware on the server
- Netscape and Visigenic Corp. will add CORBA object middleware for browser-server communications

What you should expect

- Java gets more libraries and enterprise-class applications support
- Netscape gets secure, reliable connection for Web commerce

Software delivers custom orders

CONTINUED FROM PAGE 45

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Briefs

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Financial firm puts Java to work on Web, in-house

By Philip Sim
SYDNEY, AUSTRALIA

Java applications

Bankers Trust Fund Management (BTFM) has plunged into the uncharted waters of Java development, becoming one of the first Australian companies to pioneer the technology.

While many users are still struggling to come to grips with the rapid emergence of the much-ballyhooed programming language, BTFM has already identified Java as a strategic platform for both the organization's World Wide Web-based and internal applications, said David Rothwell, BTFM vice president of technology planning and consulting.

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Off and running

The company has already developed two applications. One is a Web-based applet — a financial simulator that can be downloaded from the company's Web site (www.btfunds.com.au). The other is an internal project. Peter Horne, project manager for the Web applet project, said BTFM had developed an application similar to the financial simulator that ran on the Windows platform, using Microsoft Corp.'s Visual Basic to build the front end and C++ for the complex simulation algorithms.

"One of the lessons we learned, however, has been that the distribution costs for shrink-wrapped software are high and reduce the availability of the product, and that changes are impossible to make once the product has been shipped," Horne said.

Java lets BTFM distribute the product over the Web to a much wider audience. And changes to information such as interest rates can be implemented immediately.

However, Rothwell says Java also has a place as a general-purpose language for developing internal applications.

Java's key advantages are just as applicable if a user is developing a Web or internal application, according to Rothwell.

The most obvious edge is Java's cross-platform capabilities. BTFM runs midtier Unix servers but must also grapple with the problem of how it might run its applications on Windows NT, Rothwell said. Java is one way to overcome those difficulties.

"Also, if we think ahead to what our customers are running, we have no control over what kind of devices they are using. We can't afford to dictate to them that they should be using system X so we want to provide applications for whatever they're using. It's a much more customer-centric approach," Rothwell said.

Java also changes the way an application is developed, Rothwell said. The dynamic nature of the language means applications can be extended and redeveloped on the fly with minimal disruptions or downtime, he said.

Sim writes for *Computerworld Australia*

Vendors boost Java support, aim for enterprise

By Frank Hayes

The pieces are finally falling into place to let corporate developers use Java to build serious business applications on the World Wide Web.

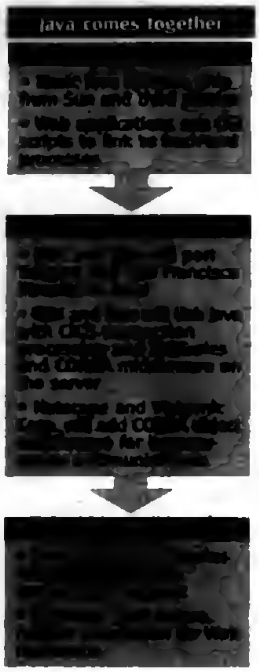
Last month, for example, IBM announced that a large collection of its development libraries will be rewritten in Java, Sun Microsystems, Inc.'s Internet development language. The libraries, which are collections of commonly used Java code, include user-interface components from IBM's Taligent subsidiary and business frameworks from its project code-named San Francisco. Together, they should make it much easier for Java developers to use that language for more than just pretty Web pages.

Sore spot

The lack of Java libraries for building server applications has irritated early Java users.

"In the future, Java might be usable on servers, but right now it's all at the front end. We have to write our servers in C++ and C — the standard traditional way," said Mark Rhoads, vice president of software engineering at Information Presentation Technologies, Inc. in San Luis Obispo, Calif., which is developing Java applications for the printing business.

As a result, client/server Java developers must juggle two programming languages and lose Java's ability to run without change on a variety of platforms.



By throwing its support — and code — behind Java, IBM joined forces with Sun and Netscape Communications Corp. to add some enterprise-class muscle to Web applications. That lets corporate Java developers do transaction processing and other common client/server actions across the Internet.

Earlier in August, Netscape announced that future versions of its Navigator browser and SuiteSpot server will let applications create a secure, reliable Web data pipeline based on the Object Management Group's Common Object Request Broker Architecture (CORBA). And IBM and Sun said they would work together to ensure that their CORBA-based communication systems could interoperate. IBM will create Java links to its MQSeries middleware and CICS transaction system.

Those moves will give the Web the infrastructure it needs to build serious client/server applications, users said. "If you want the Web client to talk to the Web server, there are not a lot of communication facilities available right now," said Alok Garg, senior consultant at Cap Gemini America in Iselin, N.J.

But it's the added libraries that will fill the most apparent need, Java developers said. Although companies such as Rogue Wave Software, Inc. in Corvallis, Ore., and KL Group, Inc. in Toronto have converted some of their C++ libraries to Java, the language has lacked full-scale application frameworks available for other languages, such as the C++ Microsoft Foundation Class libraries from Microsoft Corp.

Instead, Java developers must work around important capabilities that are simply missing, said Doug Garrett, president of AnetSc, a Java developer in Fremont, Calif. "It's a matter of how fast you'll be able to develop and deliver something," Garrett said.

"Right now, Java still lacks libraries for a lot of functionality that's available in C++," Garg said. "If IBM provides the kind of functionality that is already there in C++ and other languages, I don't think Java might need a lot of other help."

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CONTINUED FROM PAGE 45

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Three vendors announce affordable LAN switches for smaller projects, 52

The Enterprise Network

ATM is new kid on campus

Case Western enrolls ATM desktop technology

By Kim Girard

When Case Western Reserve University laid its network foundation eight years ago, networking gurus there could only imagine the future of broadband technology.

But the Cleveland institution decided to put its money on fiber. It replaced campus copper lines with fiber-optic circuits that travel from the network backbone to every desktop.

By tapping fiber's capability to carry voice, video and data, school officials knew they would be prepared to adopt new technologies coming down the pike. "We thought if we wired the campus with fiber, we'd have the longest view of any technology," said Raymond K. Neff, Case Western's vice president of information services.

By 1989, the school was offering 10M bit/sec. Ethernet connections to students in their dorm rooms — ahead of the curve for the time. But soon, adept students and faculty members demanded a faster, more capable network.

"They've matured, so Ethernet isn't good enough anymore," Neff said.

When students and faculty return to school this fall, they will be introduced to a powerful network that brings Asynchronous Transfer Mode (ATM) to the desktop. They will use ATM's 155M bit/sec. links to send full-motion video clips or participate in classes via videoconferencing. "Eventually, you'll be able to go home and take classes that originate here," Neff said.

Risk factor

Of 9,000 computers campuswide, 400 sport ATM pipes that are connected by 30 ATM switches and seven gateways to Ethernet segments of the network. Thirty-four of the 92 campus buildings are wired, and more computers are being added to the ATM network.

Although Fast Ethernet and Gigabit Ethernet are touted as cheaper, simpler options to ATM, Jeff Gumpf, Case Western's assistant director of engineering, said he doubted those technologies would be scalable enough or simple enough to implement video.

Most corporate users aren't ready to take a risk on new technologies such as Fast Ethernet and ATM, said Christine Heckart, director of broadband consulting at TeleChoice, Inc., a consultancy in Verona, N.J.

"A lot of companies need more than they've got, but they don't have time or the money" to rip out the old network, she said. Universities have a much easier time financing and cost-justifying their networking projects, she said.

It took several years to iron out the kinks and run trials with the ATM equipment, Gumpf said. At first, Case Western found that many ATM products it tested were geared toward small workgroups of 10 to 12 users.

Gumpf figures Case Western has invested from $20 million to $25 million on the network in the past eight years, with the ATM component costing $2.5 million to $3 million. But the investment is worth it, Neff said.

Case Western students *will be able to use ATM links on the desktop to send full-motion video clips or participate in classes via videoconferencing*

Taking the helm of LAN/WAN management

Tools expand to stand watch on hybrid WANs

By Patrick Dryden

When WANs act up, business suffers. To help maintain vital wide-area networks, three vendors are expanding their tool kits.

Responding last week to WAN managers' needs for better performance monitoring and support for diverse connections were StonyBrook Software, Inc. in Bohemia, N.Y.; Visual Networks, Inc. in Rockville, Md.; and 3DV Technology, Inc. in Nashua, N.H.

WAN software

Each vendor's product was designed to help central operations staffs watch the many different links that make up their hybrid WANs.

For example, the National Weather Service must keep its WAN flowing to deliver timely data such as storm updates and current maps. But managers were caught in a finger-pointing match with the carrier that supplies the frame-relay circuits that join the Weather Service's offices.

"We needed some way to look into the connections and interpret the traffic flow to determine if our routers or their connection caused problems," said Joe Tabaco, systems analyst in the service's Eastern region. Tabaco adopted StonyBrook's Router-Manager/AutoBahn to watch the frame-relay circuits, and then be beta-tested a more complete version called IntraNet Manager.

IntraNet Manager, which is available now, runs on Windows NT and combines real-time network management functions with mapping, historical reporting and de-

WANs, *page 53*

LAN applications link desktop to enterprise

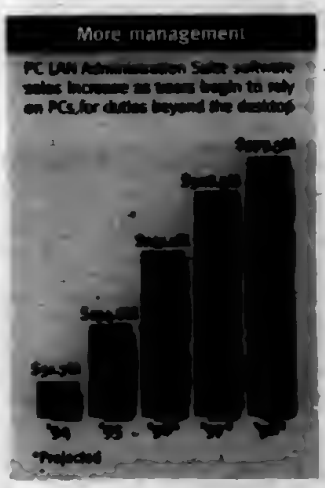
By Bob Francis

As PCs take on greater roles in the enterprise, systems managers are starting to call for better desktop and server management tools.

For instance, one Wall Street firm uses its PCs at night to do data processing. To do that, it has to know the status of each PC on the network. "We have to monitor the PCs, so that if that system goes down, we can move the processing to another system," said the company's systems manager, who asked to remain anonymous due to company policy.

And although many information systems managers expect to tie into large systems management frameworks, such

LANs, *page 53*



Source: International Data Corp., Framingham, Mass.

Trio unveils low-end switches

By Bob Wallace

For small workgroups and remote offices, there's no need to buy a Cadillac for LAN switching when a Chevy will do. A trio of vendors recently announced affordable LAN switches for those smaller projects.

Cisco Systems, Inc., 3Com Corp. and Digital Equipment Corp. previously had focused on midrange and data center switches. They have now turned their attention toward the burgeoning low-end market.

LAN switches

Cisco unveiled Catalyst 3200, a stackable LAN switch, which — unlike most small systems — can be equipped with a wide-area network module that lets users tie remote sites to corporate networks.

Sales of internetworking gear have soared because they are more flexible, easier to manage and take up less room than chassis-based systems, analysts said.

Good move

"This WAN functionality is definitely essential for companies that need switching at smaller remote sites," said Eric Hindin, a senior program manager at The Yankee Group, a consulting and research firm in Boston. "Combining robust switching and WAN support is a smart packaging move."

Mike Ruhrdanz, director of networking at the University of Nebraska at Lincoln, agreed.

"I can see the 3200 being very popular at remote offices because it provides users most of the functionality previously available only with bigger switches at an affordable price," he said. "We plan to evaluate the 3200 soon."

The 3200's WAN module can support serial WAN links and Integrated Services Digital Network links.

The base price of the Cisco switch is $4,495, without switching or uplink modules. The two-port WAN module costs $1,695. The switch will ship in October.

Digital weighed in with a family of inexpensive Ethernet switches, including the following:

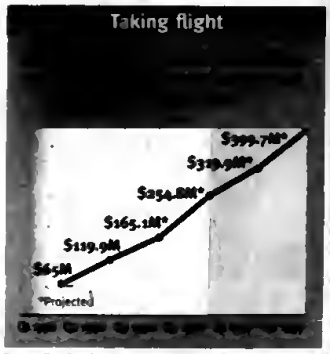
- The EtherWorks Switch 8T, which has eight switched Ethernet ports. It costs $995.
- The EtherWorks 2TTX, which has two ports that can run at 10M or 100M bit/sec. It can process packets in four different modes, depending on users' performance needs. It costs $1,249.
- The EtherWorks Switch 6T/2TX, which has five switched Ethernet ports. It costs $2,599.

All three switches will ship this month.

Meanwhile, switching powerhouse 3Com unveiled OfficeConnect Hub 8/TP100 Fast Ethernet hub. It provides 100M bit/sec. bandwidth through each of eight ports at a cost of about $175 per port.

For added flexibility, the Fast Ethernet hub can be stacked with 3Com Ethernet and Token Ring switches, hubs and routers.

The hub was designed for power users at small sites that need 10 times the bandwidth of regular 10M bit/sec. Ethernet LANs. It is targeted at computer-aided design and manufacturing applications and medical imaging and multimedia applications.



Source: The Dell'Oro Group, Menlo Park, Calif.

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If we built a $36 million telecommunications network in the Russian

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WANs

CONTINUED FROM PAGE 51

vice configuration tools. Pricing starts at $1,995 for the application and agents for each managed device.

StonyBrook also offers WANServices Manager, a tool kit focused on managing frame-relay, Integrated Services Digital Network and X.25 carrier services. It costs $4,995.

Like StonyBrook's tools, 3DV Technology's RouterPM monitors data gathered by routers to warn of developing problems. Version 2.5 of RouterPM, due next month, expands the variety of router interfaces it can diagnose and offers a World Wide Web interface to make its data more accessible.

RouterPM also runs on Windows NT. Cost varies by WAN size, from $100 to $1,000 per managed device. The companion software that gathers performance data over time for capacity planning costs $5,000.

Visual Networks takes a different approach. Its Visual UpTime system lets managers look inside frame-relay circuits — and now private lines as well — by replacing each data service unit/channel service unit with its own hardware.

Visual UpTime also tracks traffic bursts by the second for immediate monitoring instead of just by 15-minute periods for long-term trend analysis.

"Real-time monitoring helps us be more responsive in our troubleshooting and verify each carrier's performance throughout our global WAN," said Scott Meyers, network operations manager at agricultural supply firm Cargill, Inc. in Minneapolis.

The expanded version of Visual UpTime, available now, starts at $7,500 for the central console and database. The interfaces cost $1,195 for 56K or 64K bit/sec. connections or $3,595 for T1/E1 connections.

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LANs

CONTINUED FROM PAGE 51

as IBM's Tivoli Management System or Computer Associates International, Inc.'s CA-Unicenter, those systems have a long way to go in managing desktop environments, analysts said.

CA last week took steps to integrate with PC servers, linking CA-Unicenter with Intel Corp.'s LANDesk and Microsoft Corp.'s System Management Server (SMS), both LAN management packages. Currently, users of CA-Unicenter, for instance, can monitor LANs and PCs for alerts and messages but can do little to solve problems.

Once these links with LANDesk and SMS have been established — probably by year's end — systems managers can take actions from CA-Unicenter that will be carried out by LANDesk or SMS. For instance, if CA-Unicenter informs a systems manager that a disk drive is full during a backup, the manager can use CA-Unicenter to switch to a different disk drive.

Desktop management

At the same time, enterprise-level frameworks such as CA-Unicenter and Tivoli are moving to manage the desktop. PC desktop and server management tool vendors are attempting to build more enterprisewide features into their desktop administration products. Many of these tools offer launch and event integration, but analysts said the vendors need to deliver the next step — integration at the data level.

Last week, Symantec Corp. in Cupertino, Calif., moved in that direction, adding an enterprise management feature to its Norton Enterprise Framework. The Norton Administrator Suite-Premier Edition can manage more than 1,000 desktop and server nodes or large wide-area networks. Available now, pricing starts at $57 per node for a 1,000-node license.

Also marching in to share data with its desktop administration tools is McAfee Associates, Inc. in Santa Clara, Calif.

McAfee has integrated its Vycor help desk products database with its SabreLAN Workstation LAN administration package. Vycor Enterprise, lets help desk workers solve user problems from the help desk by using SabreLAN Workstation's inventory, metering, software distribution and menuing features, said Tim Davis, product manager for McAfee's help desk line. Vycor Enterprise costs $25,000 for an enterprisewide site license.

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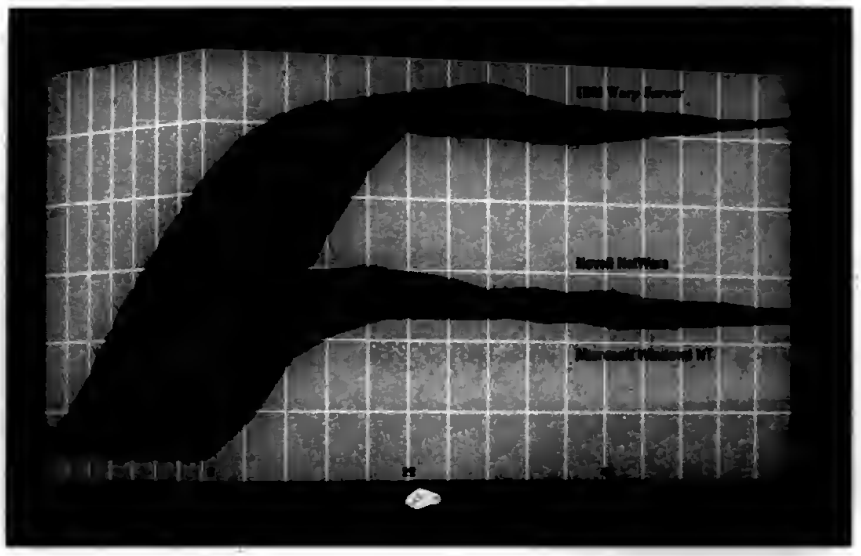

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Livermore Lab opens data warehouse to Web browsers, 58

The Internet

Users prefer to stick with the fax machine

Corporate fax use is on the rise

By Tim Ouellette

It's a little early to start dismissing the fax. Even with the dominance of electronic mail in business, the use of fax machines and computer fax software is expected to grow, not wither sway.

A four-year study of fax usage by The Gallup Organization found that 60% of large and midsize companies are faxing more than they did last year, often choosing the fax machine over other messaging options such as E-mail, voice mail or overnight courier.

"The advent of E-mail isn't eating into fax usage except in intracompany communications," said Msury Kauffman, a managing partner at Kauffman Group, a consultancy in Cherry Hill, N.J.

In particular, users bought standalone fax machines in record oumbers last year, according to Andrew Johnson, an analyst at Dataquest, a research firm in San Jose, Calif. And the use of fax toner, which is necessary to print all those faxes, is up 12% from last year, said Peter Davidson, principal st Davidson Consulting, Inc. in Burbank, Calif.

All in one

Still, multifunction produets — those that combine fax and similar technology such as scanners, copiers or printers — will be the growth factor, not stand-alone fax machines, Johnson said.

"I think faxing has been an overlooked part of a communications strategy," Kauffman said. "Because no ooe is responsible for faxing, there is no dedicated decision-maker, and people can't decide whether it belongs to [information systems] or [telecommunications]."

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Next generation of off-line browsers may prevent Web-surfing wipeouts and help users . . .

Take a load off

By Garrett N. Ray

Sshhhh. Don't tell anyone. But there is a dirty little secret about the World Wide Web: It's a mess. Disorganized, chaotic and always in a state of flux, the Web is a time-wasting, resource-hungry money sink for your company. But there is a solution, albeit one in its early stages. Since early this year, several software vendors have released a new class of Web tools called off-line browsers. The browsers let users save entire Web sites locally, which can reduce online connection time, server overloads and a host of problems related to the chaos of the Web.

Open Market's OM-Express *lets users download catalogs from a Web site and view them off-line*

Two off-line browsers that were released in recent months — WebEx from Traveling Software, Inc. in Bothell, Wash., and OM-Express from Open Market, Inc. in Cambridge, Mass. — are among the latest entries.

Browser functions

Off-line browsers can monitor Web sites for new pages. They can be scheduled to retrieve pages — or entire sites — at off-peak hours. They then place Web pages on local hard disks for storage, which in most cases will allow faster Internet cruising than even the fastest T1 corporate connection.

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PRODUCT REVIEW

Similar setups

Despite their different target audiences, both products accomplish basically the same tasks. Even at their cores, implementation is nearly identical.

WebEx and OM-Express each include a Hypertext Transport Protocol (HTTP) proxy server, which is installed on the user's hard disk drive. When a user is online and surfing the Web, the proxy server relays HTTP requests from the browser to the appropriate Web server. In other words, it is transparent.

But when the user is off-line, the proxy server redirects HTTP requests to a local storage area on the hard disk. Unlike some other off-line browsers, OM-Express and WebEx maintain the original form of all uniform resource locators (URL). Hypertext links on a Web page work just as they would if the user were online.

Off-line browsers, *page 58*

Livermore Lab opens data warehouse to Web browsers, 58

The Internet

Users prefer to stick with the fax machine

Corporate fax use is on the rise

By Tim Ouellette

It's a little early to start dismissing the fax. Even with the dominance of electronic mail in business, the use of fax machines and computer fax software is expected to grow, not wither away.

A four-year study of fax usage by The Gallup Organization found that 60% of large and midsize companies are faxing more than they did last year, often choosing the fax machine over other messaging options such as E-mail, voice mail or overnight courier.

"The advent of E-mail isn't eating into fax usage except in intracompany communications," said Maury Kauffman, a managing partner at Kauffman Group, a consultancy in Cherry Hill, N.J.

In particular, users bought stand-alone fax machines in record numbers last year, according to Andrew Johnson, an analyst at Dataquest, a research firm in San Jose, Calif. And the use of fax toner, which is necessary to print all those faxes, is up 12% from last year, said Peter Davidson, principal at Davidson Consulting, Inc. in Burbank, Calif.

An average E-mail costs
2¢
per message

An average long-distance fax costs
$1.50
over phone lines or
15¢
over the Internet

1 trillion
E-mail messages were sent last year

78%
of telecom managers aren't aware of their faxing costs

80%
of companies that expect to increase their fax use plan to do so via fax software, not additional fax machines.

Information compiled from the following sources: Dataquest Managing Associates, Arlington, Va.; Gallup Organization, Inc., Palo Alto, Calif.; Alphawest Telecom, Toronto; Equitrac, England

All in one

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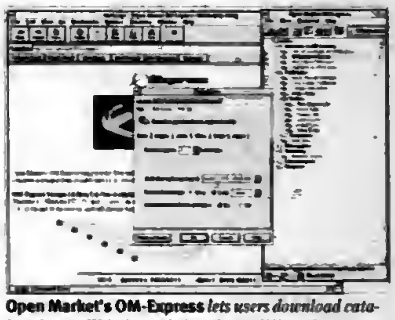

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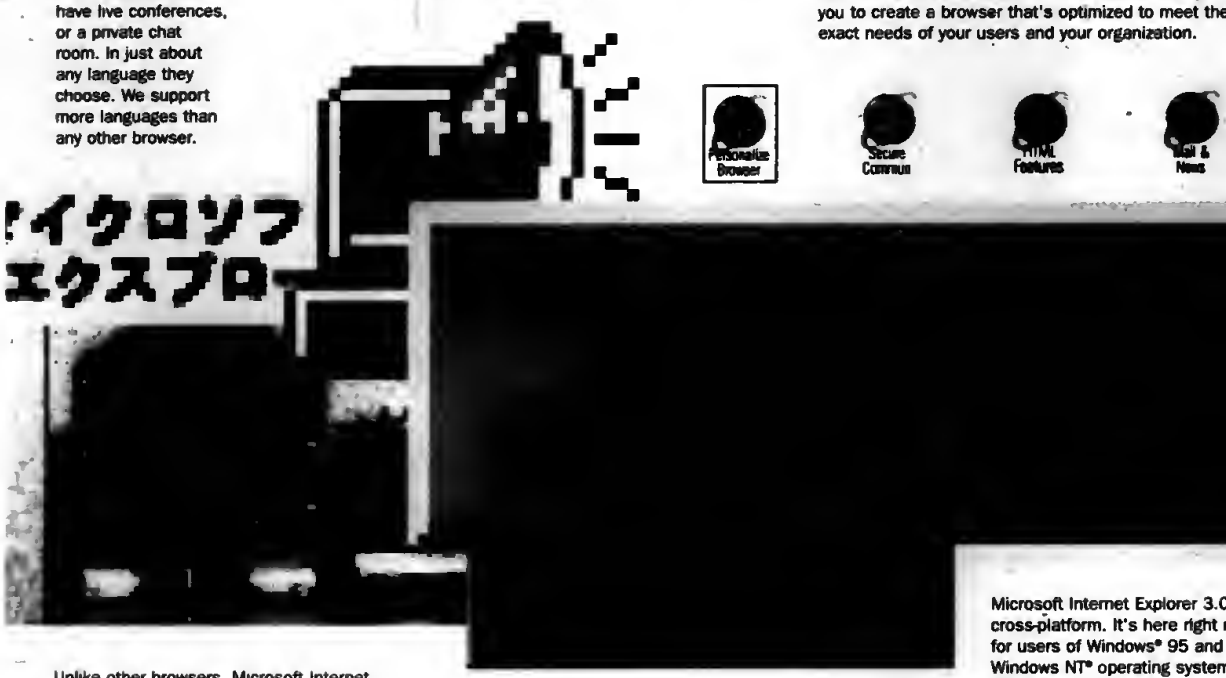
Off-line browsers, *page 58*

Microsoft Internet Explorer 3.0

Our ActiveX technologies protect your investment in development tools, documents, and training. Which makes it easy to transition existing LANs and WANs into Intranets.

Groups of people can share applications, have live conferences, or a private chat room. In just about any language they choose. We support more languages than any other browser.

We offer an Administration Kit that makes it easy for you to create a browser that's optimized to meet the exact needs of your users and your organization.



Unlike other browsers, Microsoft Internet Explorer 3.0 is actually a reusable ActiveX component. So you can use it to quickly add browsing capabilities to any application.

You can enjoy a much higher level of security, since Microsoft Internet Explorer supports the newest standards: SSL2.0, and 3.0, as well as PCT 1.0.

Microsoft Internet Explorer 3.0 is cross-platform. It's here right now for users of Windows® 95 and Windows NT® operating system, and will soon be available for people who use Windows 3.1, or Macintosh.®

*Connect time charges may apply

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How much better can a browser be?

CLICK THE button AND STAND BACK

www.microsoft.com/ie

NetMeeting

Now there's a much better way to develop intranet applications. Because we're introducing Microsoft® Internet Explorer 3.0. And in every way, it's a step ahead of the rest. It's based on ActiveX™ technology, which lets you leverage your existing investments in code, documents, and and user training. And our tools make it easy to deploy, develop, and administer your intranet. With the new Administration Kit, you can easily manage and distribute versions of the browser that are optimized for your organization's needs. With NetMeeting,™ your end users can communicate with groups of people across the street or around the world. They can even have virtual meetings where they use an electronic whiteboard, and work back and forth on the same project. In real time. But whatever you develop, you can take the full potential of the Internet, and turn it loose. And no matter if you have 100 users or thousands, Microsoft Internet Explorer 3.0 is yours, absolutely free.* Just go to www.microsoft.com/ie. Then click once. And get ready to see what a real browser can do.

Microsoft®

Where do you want to go today? www.microsoft.com/ie

Lab tries warehousing on the Web

By Kim S. Nash

Thick-client syndrome drove Lawrence Livermore National Laboratory to launch a data warehousing application that will let any user with a World Wide Web browser access mainframe and Unix databases.

Livermore Lab isn't the first to try Web warehousing. Cracker Barrel Old Country Store, Inc. in Lebanon, Tenn., for example, built a Web-based data analysis application late last year [CW, Oct. 30, 1995].

But large Web warehousing applications still aren't common, partly because connecting Web systems to legacy databases can be tough. Livermore Lab hopes to overcome that obstacle with new products from Virtual Integration Technology, Inc. The Cupertino, Calif., vendor last week shipped two $50,000 products designed to grab and translate legacy data, then usher it on to the Web.

Data delivery is becoming a hot issue among the Web-wise.

Other companies are prepping products to distribute legacy data to Web servers and browser users. Cognisoft Corp. in Redmond, Wash., for example, plans to beta-test a similar utility in November.

Virtual Integration's automated delivery products saved Livermore Lab from writing custom code or fiddling with unfamiliar Web development tools, said Francine Alford, a project leader at the research lab in Livermore, Calif. The impetus behind the lab's Web warehousing application was to avoid one of the major money-eaters of traditional client/server systems: costly and unwieldy PC software.

A warehouse prototype built with Oracle Corp. products convinced Alford that a plain client/server system would run up big bills. "Thick clients require more administration, more memory, more computing power, more disk space. Those are a whole lot of issues we just didn't want any part of," Alford said.

"One [version of the] application might require one version of SQL Net, and another might require a different version of SQL Net," she explained, referring to Oracle's database middleware.

Alford declined to say how much a traditional client/server approach would have cost.

The Web interface on Livermore Lab's warehouse application lets users peruse an intranet that shows available financial and other data. They can place orders for facts, figures, spreadsheets, presentations and several other types of information by using predefined descriptors such as "region" or "project."

Virtual Integration's DeliveryManager finds requested information — a table from a database or spreadsheet previously created by another user, for example — then delivers it to users in PC formats such as those created by Microsoft Corp.'s Word, Excel or PowerPoint applications.

DesignManager sits between location and delivery and translates legacy data to the requested desktop format.

Tool of the trade

The Internet is an important means of communications at Livermore Lab. For example, employees and research and development partners can take Web-based training courses in hazards control, electrical safety and other topics.

Lawrence Livermore National Laboratories
Livermore, Calif.

Problem:
Giving users access to mainframe and Unix data for analysis, without building extensive new applications or buying new desktop machines

Technology:
Netscape Navigator Web browser, Oracle database, Virtual Integration Delivery-Manager, Evolutionary Technologies Extract

Status:
A handful of users are testing the application. Formal rollout is slated for November. Up to 1,000 users are due to get access by the middle of next year.

HTML by the book

***Beyond HTML*, by Richard Karpinski. Osborne McGraw-Hill, New York; 407 pages, $27.95 (paperback).**

Beyond HTML is exactly what it says: a guide for webmasters who want to move beyond the standard tricks of the World Wide Web-building trade and move into cyberreality.

It covers how to use Adobe Systems, Inc.'s Acrobat and other document formats that could act as alternatives to Hypertext Markup Language (HTML). Then it moves on to Java coding and doing Virtual Reality Markup Language (VRML) three-dimensional programming.

***Setting Up an Internet Site for Dummies*, by Jason Coombs and Ted Coombs. IDG Books Worldwide, Foster City, Calif.; 342 pages, $19.99 (paperback).**

This latest in a series of Internet titles from IDG Books, which has the same parent company as *Computerworld*, furthers the "For Dummies" series franchise with a step-by-step guide to what the Internet is and how to use it.

The tone of the instruction is aimed at the uninitiated, but the book does cover Web site creation, how to advertise a site and some of the more advanced Web issues such as JavaScript, security for online commerce, VRML and multimedia.

It also includes discussions on archie, gopher, Internet bulletin boards and other bits of the Internet fabric that have been submerged recently in the wash of HTML hype.

Off-line browsers

CONTINUED FROM PAGE 55

One drawback is the slightly misleading nature of OM-Express' Express It packages, which purport to let users download entire product catalogs from a Web site and view them off-line. One is led to believe that Express It packages contain a complete Web catalog, but they actually are a set of parameters, URLs and downloading schedules. Once those are obtained, users still face the unpleasant task of downloading a multimegabyte Web site from afar. In short, Express It packages don't deliver much convenience to users but do provide Open Market with a salable marketing feature to catalog firms.

Site monitoring and updating are embedded in OM-Express and WebEx. For example, you can have either program automatically check competitive sites on a weekly basis. New and updated Web pages (for example, daily press releases or new product updates) will be flagged for your inspection.

Both products include scheduling functions that let users create retrieval or monitoring schedules for specific Web sites. Presuming you have the correct Internet connection software (meaning one of 12 TCP/IP stacks for OM-Express or Windows 95 TCP/IP for WebEx), both products can be configured to automatically access and download Web sites at any time. That could be at 3 a.m., for instance, when a site may be less busy, connection rates may be lower or the user's machine may be idle. Both programs can be customized for hourly, daily, weekly or custom schedules, and they include facilities to transparently access password-protected Web sites. Performance distinctions weren't measurable, but it is safe to say both programs operate better at nonpeak hours.

Both products automatically invoke a user's Internet log-on software if an off-line Web page includes a hyperlink that isn't stored on the local hard disk. In such cases, they will go to the Web to let you examine the page through your browser. Both products will run Java applets in off-line mode.

The differences

OM-Express and WebEx take separate paths with their user interfaces and implementations to radically different ends.

As mentioned, WebEx has the more friendly interface and operation of the two. All controls are in Web pages, as are the directories of Web sites and pages that have been downloaded.

In practice, customization is a bit slower with WebEx than it is with OM-Express because all parameters and operational controls are stored as HTML pages that appear in the local browser. When users visit a new Web site with WebEx running, the program's agent automatically adds a series of controls to the top of the page. (But this didn't seem to work with the text files that often are found on the Web.) With those controls, users can easily add a page or a site to the local WebEx directory.

OM-Express is operated via a separate program that runs in conjunction with the browser. It provides essentially the same program and options controls described above, but the OM-Express interface relies mostly on cryptic icons for program control and status messages. Those are confusing and irritating to use.

Unlike the simpler WebEx, OM-Express doesn't provide an easily monitored status window. That makes problem-solving difficult if not impossible.

OM-Express also has a slightly more intrusive proxy server than WebEx, which provides ample opportunity for fine-tuning and debugging sessions.

It is worth noting that both products are early releases. There is little doubt both will evolve in their design and functionality. Off-line browsing is a relatively new technology.

OM-Express will probably evolve as a tool of greater use to Web publishers and their customers, whereas WebEx will appeal to the individual user. (Tie-ins to the company's LapLink are fairly obvious.)

But until the Internet bandwidth dilemma is solved and deployed, off-line browsers will have a place with most Web users.

Ray is an Internet consultant and writer in North Conway, N.H.

State makes Discovery: CA's year 2000 conversion software, 60

Corporate Strategies

The paper chase

Madison Paper's Daniel King *says the AI project had a one-year payback*

AI-based software models help cut production costs

By Thomas Hoffman

Artificial intelligence never lived up to the hype of the early 1980s, but one paper manufacturer is proving that the technology isn't just pulp fiction, either.

Madison Paper Industries began using AI-based software models last year to schedule production more efficiently.

The company has saved $2 million to $3 million in transportation and manufacturing costs, said Adam Stearns, manager of customer service and logistics at the Madison, Maine, company.

For example, Madison Paper uses the software to improve its load optimization, which means figuring out the most efficient way to load and ship its paper on trucks and trains. The result: Madison Paper has cut transportation costs by 6%.

Artificial intelligence

The AI software is also used for trim optimization, in which Madison Paper seeks to make the most efficient use of the rolls used for customer orders.

After one year, the software has helped the company save 1,400 tons of paper.

Madison Paper, a partnership between Myllykoski Oy in Helsinki, Finland, and The New York Times Co., makes the kind of paper used by *Rolling Stone* magazine, *The New York Times Magazine* and retail inserts.

Down the line

The AI software, developed for Madison Paper by IBM Research, also helps managers determine how one customer's order will affect other orders in the pipeline.

"The combination of orders we can run at any time is overwhelming. With hundreds of orders and millions of possibilities, analyzing each one [ourselves] is impossible," said Daniel King, who oversaw the AI project when he was manager of information services at Madison Paper.

King recently became chief information officer at Myllykoski's U.S. unit in Madison.

It used to take managers four hours or more using a PC-based optimization package to calculate the production ramifications of a customer's order.

With the AI package, which runs on an IBM RS/6000 system, Stearns gets answers to what-if queries in 15 minutes, he said.

King said Madison Paper considered rules-based expert systems but found that they are too inflexible. The software has to

Paper chase, *page 60*

Re-evaluation

Phoenix IS dept. looks at itself through users' eyes

By Gary H. Anthes
PHOENIX

The Information Technology Department (ITD) of this city's municipal government this year plans to complete 160 software development projects, support 34 LANs, service 800 network trouble calls and process 280,000 online transactions per day.

Who cares?

It turns out that not even the city government cares all that much any more about those or 28 other traditional "activity-based" measures of information systems performance. Instead, the ITD is leading a citywide move toward "results-based" performance measures. Those focus on business outcomes rather than inputs and on the quality of customer services rather than the detailed process metrics behind the services.

Dick Vance

The wrong stuff?

"IS departments do a lot of stuff, but is it the right stuff?" asked Carl A. Myers, the city's assistant information technology director. Counting keystrokes and service calls may be useful for budgeting, he said, but it doesn't answer the question, "Is what we are doing appreciated?"

Myers said he hopes that 14 results-based measures will shed light on that question. For example, one requires tracking actual "failures, problems and customer complaints" against goals for three months after delivery of a new system or service. Another monitors whether the ITD meets its goals for timely response to systems problems.

The ITD finished a project to define the measures in April and is beginning to put them in place.

Michael G. Ingersoll, the city's deputy personnel director, said the move to results-based performance measures is welcomed by end users. "Our Information Technology Department is moving from a centralized, mainframe kind of we-are-the-experts mentality to more of a customer-driven outlook," he said.

Ingersoll said managers in all city departments increasingly are evaluated against customer-satisfaction goals as part of their compensation reviews.

Because the new measures are tied to an organization's mission, they have the virtue of being more "durable," Myers said.

Phoenix IS, *page 60*

Selling managers on results-based measures

One drawback to results-based performance measurement is getting buy-in from managers.

Department managers are likely to resist being measured against objectives that they feel aren't under their complete control.

Phoenix's municipal government, in its drive toward results-based performance measures, has tried to deal with that by telling department managers it is OK to fail — at least initially. "Our city manager doesn't mind if, in our effort to manage better, we start off reporting mediocre results," said Carl A. Myers, the city's assistant information technology director.

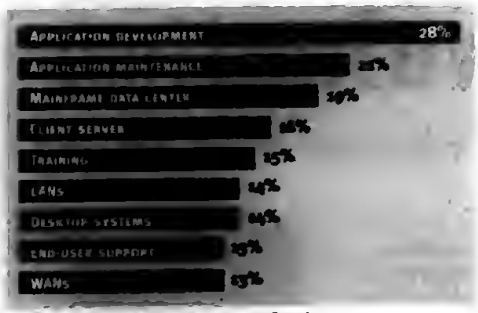
George A. Francis, an independent consultant who is helping the ITD and the city's fire department establish results-based programs, said such measures should be presented to managers as carrots, not sticks.

"Contrary to worrying about losing their jobs, staff will realize that use of such measurements will help them keep their jobs as their organization grows in effectiveness," Francis said.

— Gary H. Anthes

SNAPSHOT **Help wanted**

A ranking of activities currently outsourced or being considered for outsourcing at many companies



Base: 135 organizations, multiple responses allowed

Source: Outsourcing Institute, New York

State makes Discovery: CA's year 2000 conversion software

By Kristi Essick
NEW ORLEANS

Computer Associates International, Inc. announced here recently that the state government of Alabama will use CA's Discovery 2000 consulting and software offering to tackle the year 2000 problem in 128 state agencies.

The year 2000 problem stems from an anomaly in many software applications that are central to running enterprises around the world. Those applications will encounter problems at a code level when computer systems read the date standard "00," written in traditional two-bit code, as the year 1900, not 2000.

To correct the problems, businesses need to analyze application code line by line — at an average cost of $1 per line — and correct the date specification code in the process, said Marc Sokol, vice president of advanced technology at CA. If the problem isn't corrected, business-critical applications in realms such as insurance, tax collection and electronic data transfer could become inoperable.

Year 2000 problem

Alabama decided to use CA Discovery 2000 because "CA provided the ability to measure the impact of the problem and a team of specialists to help define the scope of the project," said John Parsa, Alabama's finance department manager.

CA Discovery 2000 is a suite of software, tools and personalized services, including portfolio investment, project planning, education and conversion techniques. The suite's applications include CA-Impact/2000, which identifies needed date changes and the cost to fix them; CA-Inventory/2000, an application that categorizes source code by language; and CA-DataServer/2000, which does the processing for date-change conversions.

Alabama officials haven't announced the extent to which they will use the products. The state has initially agreed only to participate in the assessment stage of the CA Discovery 2000 program.

Other organizations using the Discovery 2000 system include Oregon's state government, Xerox Corp., Cox Health Systems and paper supplier Temple-Inland, Inc.

Essick writes for the San Francisco bureau of the IDG News Service.

Stream joins flow of online services

Support outsourcer offers help desk aid online and via phone, without contracts

By April Jacobs

Stream International, Inc. is leveraging its established technical support staff of 3,500 specialists to launch a pay-per-use online and telephone help desk service.

Stream is a $1.6 billion software reseller and technical support outsourcer in Westwood, Mass.

Help desk service

Broad support

The service will be aimed at corporate users and consumers and will support the Windows 95 operating system and more than 100 applications, including Notes. It will offer access 24 hours per day, seven days per week.

Amy Osetek, an analyst at Dataquest in San Jose, Calif., said Stream's offering differs from others because it isn't based on contracts. Instead, fees are based on the level of interaction required by the user.

"This is the first type of service that has value-based pricing," Osetek said. She also noted that the service's success is difficult to predict because it is new.

Companies that go through mergers or growth spurts might find it helpful not to have a set contract.

Osetek said Stream expects to receive at least 500 electronic help requests per month, but she said that estimate is conservative and could expand very rapidly as the service becomes more well-known.

There are some potential downsides to electronic-based support.

"There's a great opportunity for this type of support, but the response time is much longer" than in-house support, said Osetek, who noted that it will take up to 24 hours to respond to users who submit World Wide Web-based requests. The cost for a Web-based response is $9.95.

Speed costs

But users in a hurry can ask for a phone response, which costs $29.95 and is similar to a traditional help desk call service. A phone response is guaranteed within 30 minutes. Users can also participate in a live chat session, which costs $19.95.

Users don't pay for any help request until the issue is resolved.

Free support is also being offered to users via a knowledge-base search that allows them to access information from Microsoft Corp., Lotus Development Corp., Symantec Corp., Claris Corp., Visio Corp. and Stream's support database.

Stream also offers discussion forums that its support specialists participate in.

Stream's Web site can be accessed at www.stream.com.

Paper chase

CONTINUED FROM PAGE 59

be modified every time the business changes, and the systems usually require expensive, high-powered computers to run them, he said.

But IBM's AI software can run on more-affordable Unix or other servers. And unlike rules-based systems, AI software can absorb changes and automatically integrate them into calculations, said Robert George, director of industry analysis at Advanced Manufacturing Research, Inc., a consultancy in Boston.

The AI software Madison Paper uses is based on what are called A-Teams, or asynchronous teams. Those are sets of sophisticated programs that run independently of one another — asynchronously — to generate solutions to a particular problem.

King wouldn't disclose how much Madison Paper has invested in AI, but he said the project had a one-year payback after it was launched last May.

The company is training salespeople to use the system to determine things such as the cost-effectiveness of accepting customer orders during peak production periods.

Phoenix IS

CONTINUED FROM PAGE 59

The ITD's activities will change as technology changes, but its mission won't, he explained.

The move to results-based measures has its drawbacks, Myers said. Two of the 14 measures won't be implemented right away because financial data in the city's systems isn't sufficiently detailed to support them. For example, the systems don't report the cost of very small projects such as installing one network server, he said.

Out of control

There are other drawbacks. "As you move the [performance measure] closer to where it really measures value, you are measuring things that go further and further away from the direct control of those providing the service," said Jerry Mechling, director of the Program on Strategic Computing and Telecommunications in the Public Sector at Harvard University's John F. Kennedy School of Government in Cambridge, Mass.

For example, Mechling said, a public health clinic exists to improve health and save lives, but its manager might prefer to measure something such as the number of people who receive inoculations because that is under his direct control.

To the extent that managers feel they can't control the outcomes being measured, they will resist the whole performance measuring scheme, Mechling said (see story, page 59).

Nevertheless, Mechling added, "It is an important thing to be doing. Phoenix is leading in the right direction."

John Kost, former chief information officer for Michigan's state government, said new business-oriented CIOs in government are leading the movement away from the old "bytes-and-MIPS metrics" traditionally developed by data center managers. "Phoenix is an excellent example of that," he said.

Some results-based performance measures used by Phoenix's Information Technology Department

- ☑ Delivery of information products on time vs. goals
- ☑ Problem resolution within agreed-upon turnaround times
- ☑ Customer satisfaction and perceptions (quantified) vs. goals
- ☑ Reliability of systems and services to meet goals in terms of failures, problems and complaints
- ☑ Number of new ideas received from customers and adopted vs. goals

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Managing

COMPUTERWORLD's 10TH ANNUAL SALARY SURVEY

Posh payoffs

By Alan R. Earls

According to the traditional Chinese calendar, this is the year of the rat. Given the conclusions of this year's *Computerworld* Salary Survey, many in the information systems world are finding that appellation perfectly appropriate. Indeed, the only animal that might better fit the tone of this year's findings is the cat — fat cat, that is.

While nearly everyone has seen at least some increase in compensation, and few are truly unhappy with their pay increases, *Computerworld* survey data shows that, by and large, the lion's share of this year's salary increases has gone to the top positions in IS. What's more, increases across the industry vary significantly.

Large firms and those in industries such as financial services are doling out generous increases; others are in the doldrums. For example, Frank DeBuck, branch chief at the Securities and Exchange Commission (SEC) in Alexandria, Va., complains that "we are 23% behind the private sector."

Just as significant as those two findings is a third: The trend toward pay-for-performance identified in last year's salary survey continues to gain momentum. Such compensation tied to agreed-upon performance goals is also absorbing a larger portion of overall compensation. So even as IS rank and file must live with the reality that the rich are steadily getting richer, they also must contend with the likelihood that even more will be demanded from them before they secure significant pay increases.

JOB TITLE	% CHANGE [illegible]	% SALARY CHANGE
Help desk operator	8.45%	+4.9%
Network administrator	5.94%	+4.1%
Client/server project manager	5.90%	NA
LAN manager	5.55%	0%
Systems programmer	5.54%	+4.7%
Technical specialist	4.73%	NA
Programmer analyst	4.88%	+4.2%
Systems analyst	4.53%	NA

And the pay-for-performance deck is sometimes stacked, with IS managers scooping up the largest pile of winnings. As one IS executive reluctantly explains, on condition of anonymity, "We get a smaller pool of pay-for-performance money than the rank and file, but we can also earn a bonus."

Despite the potential impact of such trends, conversations with professionals reveal little disaffection. But that may be the result of not knowing how the system works. As one Midwestern IS manager notes, "The bonuses IS managers get have worked out well, but I don't think they are widely known to others in the organization."

Similar words come from a chief information officer whose firm uses pay-for-performance for all employees but makes sure that, within that egalitarian scheme, managers are more equal than others.

Even where performance bonuses are distributed more equitably, differences between fat years and lean years can be hard to swallow.

"The rank and file like the system when times are good.

ILLUSTRATIONS BY CHRIS LANDER

IS managers are drawing bigger salaries and bonuses. But they aren't always sharing the wealth with their staffs.

But when external factors curtail profits, there is often a sense of disappointment," says the IS manager at an electronics firm in the Pacific Northwest. His company offers employees performance bonuses from a "gain-sharing" account tied to company income.

The answer, according to Mark Wilkins, CIO at Empire Fire and Marine Insurance Co. in Omaha, may be to decouple rewards from company performance — unless an individual's job can be closely linked to bottom-line results. His argument: IS at most organizations must follow the marching orders of the company's frontline units and isn't to blame when sales falter or profits slip. As a result, Wilkins dishes out rewards based only on internal measures of performance.

"At the beginning of each reporting period, we set down detailed goals and responsibilities that can be quantified with each individual," Wilkins says. Compensation above base salary is linked to the percentage of the goals that are achieved. "If someone commits to delivering a project by a certain date, and it is 90% complete by that date, they will score 90% for that task."

In general, employees have grown to like the program, Wilkins says. But some employees consistently believe they have done better than the agreed-upon standards indicate, he adds. Wilkins says that, in his view as a manager, the system requires considerable effort to properly evaluate performance but helps clarify everyone's role in the organization and provide clear incentives.

Jan Borje, assistant vice president of IS at Intrav, a charter tour provider in Clayton, Mo., agrees that rewards based on a thorough performance evaluation are worth the effort from a management perspective. "Most people seem happy with the system," she says.

But woe to the organization that uses pay-for-performance as a smokescreen for penury. An intranet engineer at a Silicon Valley IS department complains that pay-for-performance at his firm is merely a ruse for placing individuals' raises on a bell curve. "It's a forced distribution with winners and losers, and the rules aren't clear until after the money has been passed out," he says. In locations away from Silicon Valley, he says, "where we are the only big company in town, they change the formula because they don't have to compete for people as much."

By contrast, DeBuck says pay-for-performance would be a godsend. The SEC's reward system is "highly politicized," he says, and managers must divvy up a fixed amount of money available for discretionary increases. "It starts by looking at a performance appraisal, but the only way anyone can ever get a raise is by exceeding 'highly successful,'" he says.

Still, compared with firms that use less comprehensive yardsticks, those with pay-for-performance seem to be better able to mediate between the realities of the marketplace and the needs and desires of employees.

A CIO at a North Carolina agricultural products firm sits astride the two worlds. He says he'd love to offer the rank and file pay-for-performance as a way to move toward industry pay norms and as a tool for providing incentives. "I know my network specialists are undercompensated for the efforts they are putting in," he says. But top management has turned a deaf ear to extending pay-for-performance and, as of a year ago, suspended the program that had been in place for managers.

"I really think pay-for-performance is the way to go," the manager says. "If my company doesn't wise up to that, I'm leaving." ■

Earls is a freelance writer in Franklin, Mass.

Your weight in gold

In some industries, the percentage of managers' total compensation based on job performance is exceptionally high

[illegible]	[illegible]
Computer hardware and software	26.17%
Chemical	23.30%
Insurance	21.89%
Business services, non-IS	21.22%
Health care	18.49%
Banking	17.98%

Giving it away

The highest average annual salary increases by industry:

[illegible]	[illegible]
Computer hardware and software	10.65%
Banking	6.31%
Transportation	6.23%
Business services, non-IS	5.93%
Business services, IS	5.65%
Industrial equipment	4.50%
Media	4.40%

Money is no object

The skills IS hiring managers have the most difficulty finding:

[illegible]	[illegible]
Communications skills	13.7%
Network skills	13.5%
Experience/knowledge	13.2%
Programming skills	10.3%
Business sense/skills/knowledge	9.0%
Technical expertise/knowledge	7.9%

COMPUTERWORLD's 10TH ANNUAL SALARY SURVEY

For better or worse

The highest- and lowest-paying industries, depending on job area

Job area	Highest-paying	Lowest-paying
Top IS management	Business services, IS	Nonprofit
Networks	Insurance	Nonprofit
Systems development and integration	Business services, IS	Nonprofit
Technical services and operations	Computer hardware and software	Distribution
PC end-user support	Aerospace/Automotive	Industrial equipment

TOP IS MANAGEMENT				NETWORKS				SYSTEMS DEVELOPMENT AND INTEGRATION	
CIO/VP of IS	Director of systems development	Director of networks	Director of IS operations	Manager of voice/data communications	Communications specialist	Network administrator	LAN manager	Client/server project manager, systems and programming	Mainframe project manager, systems and programming
Average: $85,345	Average: $68,116	Average: $65,622	Average: $60,208	Average: $55,227	Average: $45,117	Average: $42,858	Average: $44,976	Average: $57,812	Average: $56,336
Bonus: $11,061	Bonus: $6,308	Bonus: $4,809	Bonus: $4,666	Bonus: $2,734	Bonus: $1,690	Bonus: $1,768	Bonus: $1,895	Bonus: $4,042	Bonus: $2,639
Total: $96,406	Total: $74,424	Total: $70,431	Total: $64,874	Total: $57,961	Total: $46,807	Total: $44,626	Total: $46,871	Total: $61,854	Total: $58,975
INDUSTRY, NONMANUFACTURING				INDUSTRY, NONMANUFACTURING				INDUSTRY, NONMANUFACTURING	
Bus. Svc., IS $178,192	Insurance $88,829	Media $96,333	Banking $76,242	Insurance $68,167	Insurance $57,545	Telecom $52,850	Insurance $55,000	Trans. $88,000	Media $67,000
Media $127,458	Banking $84,029	Insurance $83,143	Media $76,000	Media $63,818	Media $53,333	Bus. Svc., IS $48,250	Trans. $54,200	Insurance $65,503	Bus. Svc., IS $65,800
Insurance $120,278	Media $82,750	Trans. $82,833	Insurance $71,620	Telecom $59,417	Trans. $52,000	Health $45,887	Banking $53,846	Banking $64,324	Banking $63,833
Retail $108,704	Retail $81,226	Banking $79,824	Retail $67,253	Bus. Svc., IS $59,000	Bus. Svc., IS $48,250	Media $46,292	Retail $51,722	Bus. Svc., Non-IS $63,950	Retail $63,800
Banking $108,467	Telecom $79,450	Bus. Svc., IS $78,000	Telecom $66,923	Bus. Svc., Non-IS $58,236	Telecom $48,017	Bus. Svc., Non-IS $45,027	Dist. $51,125	Telecom $63,333	Health $60,167
Bus. Svc., Non-IS $98,273	Bus. Svc., Non-IS $78,541	Retail $76,917	Bus. Svc., IS $66,875	Banking $57,941	Health $47,100	Banking $46,958	Media $50,583	Bus. Svc., IS $62,929	Insurance $60,783
Trans. $98,235	Bus. Svc., IS $74,250	Telecom $74,900	Bus. Svc., Non-IS $64,774	Health $56,719	Gov't. $45,919	Gov't. $46,665	Bus. Svc., IS $48,556	Retail $61,300	Bus. Svc., Non-IS $59,375
Telecom $87,867	Trans. $72,375	Health $67,763	Gov't. $60,727	Retail $55,278	Bus. Svc., Non-IS $45,846	Insurance $46,304	Bus. Svc., Non-IS $48,137	Media $58,750	Telecom $58,143
Health $82,682	Health $71,267	Gov't. $61,750	Health $66,500	Gov't. $54,129	Dist. $43,700	Trans. $43,800	Telecom $46,417	Health $57,001	Dist. $56,571
Distrib. $85,500	Gov't. $70,566	Bus. Svc., Non-IS $58,462	Educ. $59,343	Educ. $47,815	Banking $42,417	Dist. $42,036	Gov't. $45,888	Nonprofit $55,750	Gov't. $55,297
Gov't. $78,061	Dist. $67,778	Dist. $58,250	Trans. $58,000	Dist. $46,400	Retail $38,400	Retail $40,750	Health $45,368	Dist. $55,067	Trans. $53,500
Educ. $76,919	Educ. $59,370	Educ. $53,018	Dist. $55,320	Nonprofit $44,750	Educ. $37,175	Educ. $38,770	Educ. $37,050	Gov't. $53,087	Educ. $51,972
Nonprofit $73,833	Nonprofit $51,800	Nonprofit $43,583	Nonprofit $52,501	Trans. NA	Nonprofit $35,833	Nonprofit $38,750	Nonprofit $36,001	Educ. $46,346	Nonprofit NA
INDUSTRY, MANUFACTURING				INDUSTRY, MANUFACTURING				INDUSTRY, MANUFACTURING	
Computers $142,429	Computers $114,043	Computers $111,917	Computers $129,750	Computers $86,667	Computers $83,625	Food/Bev. $66,800	Computers $72,500	Met./Plas./Rubber $82,833	Computers $70,333
Forest Prod. $104,303	Forest Prod. $67,571	Chemical $77,833	Chemical $77,857	Chemical $66,500	Forest Prod. $56,500	Computers $58,000	Food/Bev. $57,000	Food/Bev. $73,000	Chemical $67,320
Food/Bev. $88,250	Consumer Prod. $76,714	Forest Prod. $74,500	Aero./Auto. $64,615	Consumer Prod. $66,125	Food/Bev $56,000	Met./Plas./Rubber $46,450	Chemical $47,143	Computers $72,500	Aero./Auto. $63,818
Consumer Prod. $67,444	Food/Bev. $71,400	Met./Plas./Rubber $64,750	Consumer Prod. $64,600	Aero./Auto. $62,083	Met./Plas./Rubber $52,000	Chemical $45,000	Forest Prod. $44,571	Consumer Prod. $71,500	Consumer Prod. $59,750
Chemical $84,321	Aero./Auto. $71,033	Aero./Auto. $61,333	Met./Plas./Rubber $62,004	Industrial Equip. $57,250	Chemical $46,900	Consumer Prod. $44,417	Consumer Prod. $44,125	Chemical $67,167	Met./Plas./Rubber $58,071
Aero./Auto. $87,088	Chemical $71,000	Industrial Equip. $54,243	Industrial Equip. $59,136	Met./Plas./Rubber $54,071	Aero./Auto. $48,227	Aero./Auto. $44,306	Aero./Auto. $43,563	Aero./Auto. $65,090	Food/Bev. $55,000
Industrial Equip. $84,859	Met./Plas./Rubber $65,910	Food/Bev. NA	Forest Prod. $56,400	Forest Prod. $51,400	Industrial Equip. $45,929	Forest Prod. $43,814	Met./Plas./Rubber $41,944	Forest Prod. $59,500	Industrial Equip. $50,188
Met./Plas./Rubber $80,833	Industrial Equip. $62,000	Consumer Prod. NA	Food/Bev. $52,125	Food/Bev NA	Consumer Prod. $38,000	Industrial Equip. $42,071	Industrial Equip. $37,918	Industrial Equip. $48,250	Forest Prod. $40,667
COMPANY SIZE (BY REVENUE)				COMPANY SIZE (BY REVENUE)				COMPANY SIZE (BY REVENUE)	
Under $100M: $77,370	Under $100M: $62,193	Under $100M: $54,583	Under $100M: $57,435	Under $100M: $40,306	Under $100M: $43,978	Under $100M: $41,982	Under $100M: $42,277	Under $100M: $51,731	Under $100M: $54,018
$100M - $499.9M: $95,973	$100M - $499.9M: $74,154	$100M - $499.9M: $68,484	$100M - $499.9M: $66,224	$100M - $499.9M: $56,969	$100M - $499.9M: $43,236	$100M - $499.9M: $45,536	$100M - $499.9M: $47,407	$100M - $499.9M: $58,570	$100M - $499.9M: $56,105
$500M or more: $146,200	$500M or more: $86,408	$500M or more: $91,985	$500M or more: $80,862	$500M or more: $69,167	$500M or more: $53,160	$500M or more: $48,350	$500M or more: $53,843	$500M or more: $70,257	$500M or more: $65,843

NA: Not available

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COMPUTERWORLD's 10TH ANNUAL SALARY SURVEY

The title extras that count

Jobs that earn the largest average additional compensation:

JOB TITLE	AVERAGE ADDITIONAL COMPENSATION
CIO/VP of IS	$11,061
Director of systems development	$6,308
Director of networks	$4,809
Director of IS operations	$4,068
Client/server project manager, systems and programming	$4,042
Manager of voice and data communications	$2,734
Mainframe project manager, systems and programming	$2,639
Senior systems analyst	$2,638
Micros manager, end-user computing manager	$2,349

SYSTEMS DEVELOPMENT AND INTEGRATION								TECHNICAL SERVICES AND OPERATIONS	
Senior systems analyst	Systems analyst	Senior systems programmer	Systems programmer	Senior programmer/analyst	Programmer/analyst	Database manager	Database analyst	Computer operations manager	Computer operations supervisor
Average: $51,136	Average: $43,062	Average: $50,009	Average: $42,553	Average: $46,139	Average: $37,495	Average: $55,521	Average: $40,240	Average: $48,360	Average: $38,050
Bonus: $2,638	Bonus: $1,686	Bonus: $1,639	Bonus: $1,300	Bonus: $1,774	Bonus: $1,264	Bonus: $2,426	Bonus: $1,567	Bonus: $2,234	Bonus: $1,212
Total: $53,774	Total: $44,748	Total: $51,728	Total: $43,853	Total: $47,913	Total: $38,763	Total: $57,947	Total: $50,837	Total: $50,594	Total: $39,262
INDUSTRY, NONMANUFACTURING								**INDUSTRY, NONMANUFACTURING**	
Banking $61,825	Banking $48,368	Banking $57,976	Insurance $51,018	Bus. Svc., Non-IS $52,188	Telecom $48,143	Trans. $80,007	Media $58,800	Insurance $58,026	Telecom $53,083
Bus. Svc., Non-IS $59,316	Trans. $48,000	Nonprofit $56,250	Nonprofit $48,000	Retail $50,095	Bus. Svc., IS $43,286	Insurance $67,464	Banking $56,167	Telecom $54,944	Insurance $42,778
Dist. $58,670	Bus. Svc., Non-IS $48,571	Insurance $55,019	Telecom $47,000	Telecom $50,944	Banking $42,481	Banking $65,273	Insurance $54,473	Trans. $54,250	Retail $42,563
Telecom $58,313	Bus. Svc., IS $49,050	Retail $54,380	Banking $48,080	Dist. $50,545	Retail $42,000	Telecom $60,900	Bus. Svc., IS $51,250	Retail $52,048	Trans. $40,000
Retail $53,500	Insurance $49,099	Bus. Svc., Non-IS $54,000	Bus. Svc., IS $48,000	Banking $49,080	Dist. $38,917	Bus. Svc., IS $59,833	Trans. $51,167	Banking $50,463	Media $38,583
Insurance $52,058	Dist. $44,044	Telecom $53,043	Media $45,533	Media $48,308	Insurance $38,647	Retail $58,500	Telecom $50,833	Media $50,278	Gov't. $38,182
Trans. $51,444	Telecom $43,786	Gov't. $51,831	Health $44,281	Insurance $48,700	Bus. Svc., Non-IS $38,046	Gov't. $53,738	Health $48,889	Health $47,536	Banking $37,974
Media $51,000	Retail $43,389	Trans. $51,899	Dist. $43,900	Bus. Svc., IS $47,500	Media $38,001	Dist. $51,571	Gov't. $48,245	Gov't. $47,408	Educ. $36,833
Bus. Svc., IS $50,750	Health $43,766	Health $50,618	Gov't. $43,006	Health $45,714	Gov't. $37,927	Media $50,067	Nonprofit $45,750	Nonprofit $46,333	Health $36,370
Health $50,727	Media $41,250	Dist. $49,540	Bus. Svc., Non-IS $42,200	Gov't. $45,153	Nonprofit $37,250	Health $50,000	Dist. $42,333	Bus. Svc., IS $45,333	Bus. Svc., IS $35,000
Gov't. $49,678	Gov't. $41,218	Bus. Svc., IS $40,000	Retail $41,625	Trans. $45,100	Trans. $36,406	Bus. Svc., Non-IS $49,375	Retail $41,625	Bus. Svc., Non-IS $40,000	Bus. Svc., Non-IS $34,046
Educ. $47,050	Educ. $40,438	Media $40,000	Trans. $38,571	Educ. $43,967	Health $35,750	Educ. $48,825	Educ. $39,150	Educ. $43,766	Dist. $34,750
Nonprofit $40,000	Nonprofit NA	Educ. $44,041	Educ. $38,444	Nonprofit $42,417	Educ. $34,303	Nonprofit $45,333	Bus. Svc., Non-IS $37,250	Dist. $41,875	Nonprofit $33,500
INDUSTRY, MANUFACTURING								**INDUSTRY, MANUFACTURING**	
Computers $60,003	Chemical $47,506	Computers $63,750	Computers $54,000	Computers $63,000	Computers $46,111	Food/Bev. $88,250	Computers $60,375	Computers $77,000	Computers $61,107
Forest Prod. $53,500	Computers $42,250	Chemical $50,000	Industrial Equip. $53,067	Chemical $55,188	Aero./Auto. $42,721	Computers $78,000	Aero./Auto. $50,417	Chemical $42,500	Forest Prod. $42,000
Chemical $50,000	Met./Plas./Rubber $48,057	Food/Bev. $50,000	Aero./Auto. $50,043	Food/Bev. $51,400	Chemical $42,500	Met./Plas./Rubber $67,000	Chemical $50,000	Food/Bev. $41,250	Aero./Auto. $42,043
Met./Plas./Rubber $57,131	Food/Bev. $47,000	Aero./Auto. $57,556	Chemical $40,000	Aero./Auto. $50,563	Consumer Prod. $40,000	Aero./Auto. $68,000	Industrial Equip. $55,333	Consumer Prod. $57,250	Chemical $38,000
Aero./Auto. $56,575	Aero./Auto. $45,411	Met./Plas./Rubber $50,000	Forest Prod. $40,000	Met./Plas./Rubber $49,470	Met./Plas./Rubber $37,902	Industrial Equip. $62,250	Met./Plas./Rubber $50,333	Aero./Auto. $57,125	Met./Plas./Rubber $37,417
Industrial Equip. $51,344	Industrial Equip. $44,700	Industrial Equip. $47,506	Met./Plas./Rubber $45,200	Consumer Prod. $48,000	Industrial Equip. $37,022	Chemical $50,375	Food/Bev. $40,000	Met./Plas./Rubber $54,182	Industrial Equip. $37,000
Food/Bev. $50,197	Forest Prod. $43,042	Forest Prod. $40,000	Food/Bev. $40,000	Industrial Equip. $42,200	Food/Bev. $36,406	Forest Prod. $56,250	Forest Prod. $40,000	Forest Prod. $47,057	Consumer Prod. $36,167
Consumer Prod. $47,000	Consumer Prod. $41,750	Consumer Prod. $42,667	Consumer Prod. NA	Forest Prod. $41,512	Forest Prod. $35,950	Consumer Prod. $55,000	Consumer Prod. NA	Industrial Equip. $47,325	Food/Bev. $28,750
COMPANY SIZE (BY REVENUE)								**COMPANY SIZE (BY REVENUE)**	
Under $100M: $51,264	Under $100M: $41,383	Under $100M $47,952	Under $100M $39,471	Under $100M. $44,681	Under $100M. $35,687	Under $100M: $51,085	Under $100M. $47,640	Under $100M: $44,500	Under $100M: $36,003
$100M - $499.9M: $52,154	$100M - $499.9M: $44,401	$100M - $499.9M: $51,816	$100M - $499 9M. $44,323	$100M - $499.9M $47,531	$100M - $499 9M $39,154	$100M - $499 9M: $57,357	$100M - $499.9M: $47,646	$100M - $499.9M: $50,728	$100M - $499.9M: $38,402
$500M or more: $58,615	$500M or more $49,355	$500M or more $56,536	$500M or more $48,397	$500M or more $53,155	$500M or more. $43,361	$500M or more: $65,172	$500M or more: $55,256	$500M or more: $50,315	$500M or more: $46,258

NA: Not available

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COMPUTERWORLD's 10TH ANNUAL SALARY SURVEY

The bucks stop here

The bonus percentages earned by top IS managers far surpass those earned by employees at lower levels

JOB TITLE	% OF TOTAL COMPENSATION EARNED AS BONUSES
CIO/VP of IS	13%
Director of networks	7%
Client/server project manager	7%
Mainframe project manager	5%
Senior systems analyst	5%
Database manager	4%
PC technical support specialist	4%
Programmer/analyst	3%
Help desk operator	3%

TECHNICAL SERVICES AND OPERATIONS			PC END-USER SUPPORT					
Lead computer operator	Computer operator	Technical specialist	Macros manager, End-user computing manager	Technical support manager / Help desk manager	Help desk operator	PC technical support specialist
Average: $30,075 Bonus: $983 Total: 31,058	Average: $24,710 Bonus: $836 Total: $25,546	Average: $34,739 Bonus: $978 Total: $35,717	Average: $46,890 Bonus: $2,349 Total: $49,239	Average: $42,092 Bonus: $1,557 Total: $43,649	Average: $29,979 Bonus: $957 Total: $30,936	Average: $32,849 Bonus: $1,355 Total: $34,204
INDUSTRY, NONMANUFACTURING			**INDUSTRY, NONMANUFACTURING**					
Telecom $37,417	Telecom $32,256	Insurance $41,950	Insurance $58,889	Insurance $52,402	Nonprofit $36,583	Telecom $38,333
Bus. Svc., Non-IS $33,000	Insurance $28,875	Telecom $41,917	Telecom $58,000	Telecom $48,000	Insurance $33,833	Insurance $37,550
Insurance $32,854	Gov't. $26,050	Nonprofit $41,833	Media $53,071	Health $47,844	Dist. $33,518	Bus. Svc., IS $36,429
Gov't. $32,263	Bus. Svc., Non-IS $26,500	Dist. $41,250	Banking $52,067	Bus. Svc., Non-IS $46,028	Bus. Svc., IS $33,400	Banking $36,300
Retail $32,031	Retail $26,300	Media $38,714	Gov't. $48,832	Bus. Svc., IS $45,400	Telecom $33,100	Dist. $34,500
Nonprofit $31,875	Trans. $25,087	Bus. Svc., Non-IS $37,050	Health $48,607	Banking $45,306	Bus. Svc., Non-IS $32,833	Retail $34,524
Health $31,304	Media $25,025	Retail $33,625	Bus. Svc., IS $46,250	Trans. $44,667	Banking $32,167	Gov't. $33,704
Educ. $30,455	Educ. $24,297	Banking $33,577	Bus. Svc., Non-IS $45,031	Gov't. $41,524	Trans. $30,500	Bus. Svc., Non-IS $33,018
Media $29,200	Health $24,296	Bus. Svc., IS $33,314	Trans. $44,700	Retail $39,017	Gov't. $30,273	Health $32,203
Banking $33,000	Nonprofit $29,200	Gov't. $32,638	Retail $42,083	Media $36,000	Media $30,000	Media $31,885
Trans. $28,958	Banking $23,582	Health $30,943	Nonprofit $41,000	Educ. $35,583	Retail $27,917	Nonprofit $31,429
Bus. Svc., IS $27,250	Dist. $23,300	Educ. $24,273	Educ. $40,474	Dist. $32,125	Educ. $27,560	Trans. $30,025
Dist. $24,021	Bus. Svc., IS $22,313	Trans. NA	Dist. $37,000	Nonprofit NA	Health $27,115	Educ. $30,000
INDUSTRY, MANUFACTURING			**INDUSTRY, MANUFACTURING**					
Computers $44,000	Computers $34,917	Computers $54,500	Aero./Auto. $60,250	Chemical $64,333	Chemical $40,333	Aero./Auto. $41,267
Forest Prod. $31,656	Aero./Auto. $28,400	Consumer Prod. $40,500	Computers $60,100	Aero./Auto. $48,450	Food/Bev $38,000	Chemical $39,250
Chemical $31,000	Consumer Prod. $25,900	Aero./Auto. $40,313	Chemical $53,067	Computers $44,200	Aero./Auto. $34,500	Computers $38,057
Aero./Auto. $31,786	Chemical $25,444	Met./Plas./Rubber $40,100	Met./Plas./Rubber $52,000	Forest Prod. $43,333	Computers $31,929	Consumer Prod. $34,125
Consumer Prod. $30,013	Forest Prod. $25,438	Forest Prod. $36,000	Forest Prod. $41,030	Met./Plas./Rubber $42,730	Forest Prod. $31,000	Met./Plas./Rubber $31,086
Food/Bev. $28,750	Met./Plas./Rubber $25,417	Chemical $32,667	Industrial Equip. $40,200	Industrial Equip. $34,500	Consumer Prod. $27,750	Food/Bev. $33,375
Met./Plas./Rubber $27,700	Industrial Equip. $24,053	Industrial Equip. $27,833	Consumer Prod. NA	Consumer Prod. NA	Industrial Equip. $26,000	Industrial Equip. $32,038
Industrial Equip. $27,103	Food/Bev. $23,300	Food/Bev. NA	Food/Bev. NA	Food/Bev. NA	Met./Plas./Rubber $25,750	Forest Prod. $28,750
COMPANY SIZE (BY REVENUE)			**COMPANY SIZE (BY REVENUE)**					
Under $100M: $28,502 $100M - $499.9M: $30,821 $500M or more: $34,548	Under $100M: $24,503 $100M - $499.9M: $25,004 $500M or more: $28,759	Under $100M: $31,520 $100M - $499.9M: $36,255 $500M or more: $41,304	Under $100M: $42,393 $100M - $499.9M: $48,176 $500M or more: $58,515	Under $100M: $38,237 $100M - $499.9M: $41,737 $500M or more: $53,831	Under $100M: $29,042 $100M - $499.9M: $30,083 $500M or more: $33,050	Under $100M: $32,007 $100M - $499.9M: $33,700 $500M or more: $33,306

NA: Not available

METHODOLOGY

Computerworld conducted a nationwide survey of information systems managers to determine the annual salaries, salary increases, additional compensations and turnover for IS personnel. The mail survey was conducted in May and June 1996; 1186 responses were received.

Average number of IS employees

Manufacturing	96
Nonmanufacturing	167

Average number of employees

Manufacturing	4,172
Nonmanufacturing	3,958

Estimated average revenue or assets (in millions)

Manufacturing	$802
Nonmanufacturing	$784

Response by industry: Manufacturing

Aerospace and Automotive	3.2%
Chemical	2.4%
Computer hardware and software	1.7%
Consumer products	1.7%
Food, beverage and tobacco	1.5%
Forest products	2.5%
Industrial equipment	5.0%
Metals, plastics and rubber	5.6%
Other	4.2%
Total	27.8%

Response by industry: Nonmanufacturing

Banking	7.0%
Business services, IS	2.4%
Business services, non-IS	3.7%
Distribution	5.0%
Education	8.1%
Government	5.0%
Health care	7.0%
Insurance	5.2%
Media	2.4%
Nonprofit	3.8%
Retail	4.0%
Telecommunications and utilities	4.2%
Transportation	2.7%
Other	5.0%
Total	72.2%

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October conferences

MANAGEMENT

Client/Server Applications Conference. Orlando, Fla., **Oct. 1-3** — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880. Fax: (508) 470-0526. E-mail address: ConfReg@dciexpo.com. World Wide Web address: www.DCIexpo.com.

Metrics for Product Development and Project Management. Chicago, **Oct. 2-4** — Contact: Management Roundtable, Waltham, Mass. (800) 338-2223 or (617) 891-8080. Fax: (617) 891-1711. E-mail address: registrar@roundtable.com.

Year 2000 Issues and Answers. Orlando, Fla., **Oct. 2-4** — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880. Fax: (508) 470-0526. E-mail address: ConfReg@dciexpo.com. Web address: www.DCIexpo.com.

HOT HAPPENING — Gartner Group's Symposium/ITxpo '96. Lake Buena Vista, Fla., **Oct. 7-11** — Contact: Gartner Group, Inc., Stamford, Conn. (800) 778-1997 or (203) 316-6757. E-mail address: apearce@gartner.com. Web address: www.gartner.com.

Technical Awareness Series/Conference '96. Marble Falls, Texas, **Oct. 7-11** — Contact: ACTS Corp., Marble Falls, Texas. (210) 693-7900. E-mail address: 76405.1417@compuserve.com.

The 1996 Conference on Managing Change. San Diego, **Oct. 10-11** — Contact: The Conference Board, New York, N.Y. (212) 339-0345. Fax: (212) 980-7014. E-mail address: orders@conference-board.org.

Future Markets: How IT Shapes Competition. Pittsburgh, **Oct. 18-20** — Contact: The Institute for Industrial Competitiveness, University of Pittsburgh, Pittsburgh, Pa. (412) 648-1701.

Telecommute '96. Phoenix, **Oct. 27-31** — Contact: Incoming Calls Management Institute, Annapolis, Md. (800) 854-0056. Web address: www.gilgordon.com.

INDUSTRIES

MediaWorks Conferences and Exposition. New York, **Oct. 7-10** — Contact: Cowles Event Management, Stamford, Conn. (203) 358-9900. Fax: (203) 358-5815. E-mail address: MEDIAWORKS@cowlesbiz.com.

Educom '96. Philadelphia, **Oct. 8-11** — Contact: Educom, Washington, D.C. (202) 872-4200. E-mail address: conf@educom.edu. Web address: educom.edu.

College of Healthcare Information Management Executives (CHIME) Fall '96 CIO Forum. Ponte Vedra, Fla., **Oct. 9-12** — Contact: CHIME, Ann Arbor, Mich. (313) 665-0000.

Information Technology: Tool for Economic Development. Portland, Maine, **Oct. 14-16** — Contact: National Association of State Information Resource Executives, Lexington, Ky. (606) 231-1905.

FS/TEC '96 — International Foodservice Technology Exposition. Dallas, **Oct. 20-23** — Contact: *Nation's Restaurant News*, New York, N.Y. (212) 756-5245 or (212) 683-4234. E-mail address: fstec96@aol.com.

Federal Imaging '96: Federal Office Systems Expo's Document Management and Imaging Conference and Exposition for the Government. Washington, **Oct. 22-24** — Contact: Reed Exhibition Companies, Norwalk, Conn. (800) 354-4003 or (203) 840-5668.

Intranet '96. Philadelphia, **Oct. 24-25** — A conference on maximizing the value of health care and pharmaceutical information. Contact: IBC USA Conferences, Inc., Southboro, Mass. (508) 481-6400. Fax: (508) 481-7911. Web address: www.io.org-ibc/hcintra/.

Food Industry Productivity Conference: Leading Change in Integrated Supply Chain Logistics. Miami Beach, **Oct. 27-30** — Contact: Grocery Manufacturers of America, Washington, D.C. (202) 337-9400. Fax: (202) 337-4508

USER GROUPS

Early, Cloud and Co. User Group Conference. Newport, R.I., **Oct. 2-4** — Contact: Liz Sanders, Early, Cloud and Co., Newport, R.I. (800) 628-2310, ext. 238. Web address: www.webinsight.com/earlycloud.

Living Disaster Recovery Planning System International User Group Conference. King of Prussia, Pa., **Oct. 13-16** — Contact: Strohl Systems, King of Prussia, Pa. (800) 634-2016.

Oracle Applications Users Group Fall Conference. San Diego, **Oct. 16-19** — Contact: Meeting Expectations, Atlanta, Ga. (404) 240-0897 or (404) 240-0999.

FileNet's Annual UserNet Conference. Anaheim, Calif., **Oct. 20-23** — Contact: FileNet Corp., Costa Mesa, Calif. (800) 345-3638 or (714) 966-3400.

Common Fall Conference. Atlanta, **Oct. 21-25** — Contact: Common, an IBM user group, Chicago, Ill. (312) 644-6619. Fax: (312) 245-1083. E-mail address: common@common.org.

SQA International User Conference '96. Cambridge, Mass., **Oct. 27-30** — Contact: SQA, Inc., Burlington, Mass. (800) 609-1992, ext. 6964. Fax: (617) 229-3780. E-mail address: userconf@sqa.com. Web address: www.sqa.com.

TECHNOLOGIES

Unix Expo. New York, **Oct. 8-10** — Contact: Blenheim Group USA, Inc., Fort Lee, N.J. (800) 829-3976 or (201) 346-1400. Fax: (201) 346-1532.

Power '96: Global Business Unplugged. Santa Clara, Calif., **Oct. 13-16** — A conference on power requirements for mobile computing and wireless communications. Contact: Giga Information Group, Norwell, Mass. (800) 874-9980 or (617) 982-9500. Fax: (617) 982-1724. E-mail address: conferences@gigasd.com.

Revitalizing Application Delivery: Bridging to the Customer. San Francisco, **Oct. 16-18** — Contact: Meta Group, Inc., Stamford, Conn. (203) 973-6785. Fax: (203) 359-8066. E-mail address: maryw@metagroup.com.

Xplor International Global Electronic Document Systems Conference and Exhibit. Orlando, Fla., **Oct. 20-25** — Contact: Xplor, Torrance, Calif. (310) 373-3633, ext. 221; Fax: (310) 375-4240. E-mail address: info@xplor.org. Web address: www.xplor.org.

SpeechTEK '96. New York, **Oct. 21-23** — Focus is on speech recognition technology. Contact: Comtel International, Wilton, Conn. (203) 834-1122. Fax: (203) 762-0773.

International Symposium on Software Reliability Engineering '96. White Plains, N.Y., **Oct. 30-Nov. 2** — Contact: Michael R. Lyu, Bell Labs, Murray Hill, N.J. (908) 582-5366. E-mail address: lyu@research.att.com. Web address: www.research.ibm.com/softeeng.

INTERNET

Digital Consulting's Internet Expo. Boston, **Oct. 15-17** — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880. Fax: (508) 470-0526. E-mail address: ConfReg@dciexpo.com. Web address: www.DCIexpo.com.

Online Expo '96. New York, **Oct. 4-6**; Los Angeles, **Oct. 25-27** — Contact: Online Expo, Los Angeles, Calif. (800) 453-4363. E-mail: info@onlineexpo.com. Web address: www.onlineexpo.com.

Electronic Commerce and Settlement. Boston, **Oct. 30-31** — Contact: The Center for Business Intelligence, Burlington, Mass. (800) 767-6200. Fax: (617) 270-6216. E-mail address: registrar@cbinet.com.

COMPUTERWORLD

Check our Web site (www.computerworld.com) for information on upcoming workshops and conferences.

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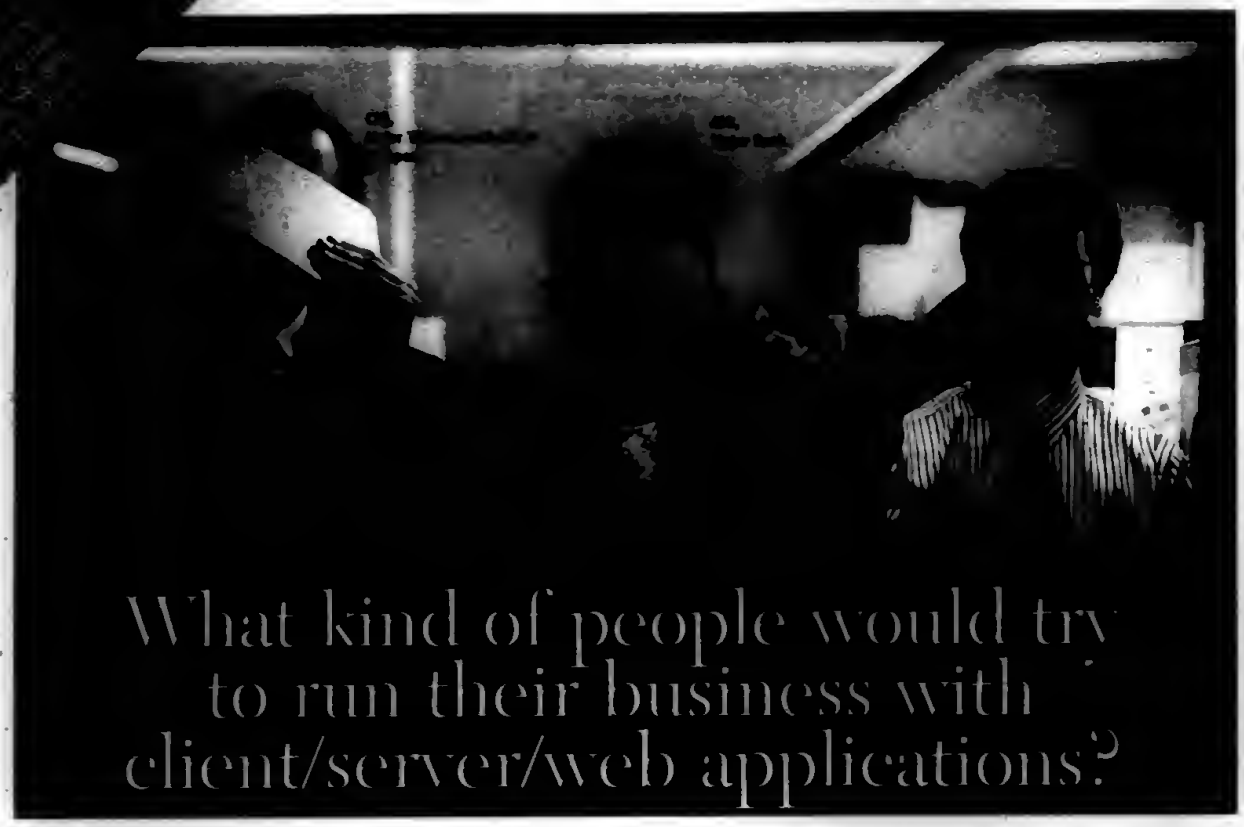

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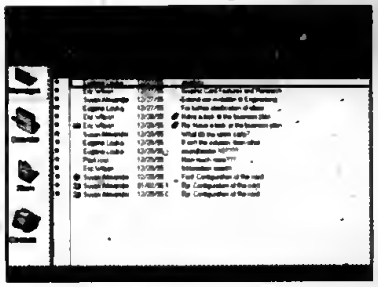
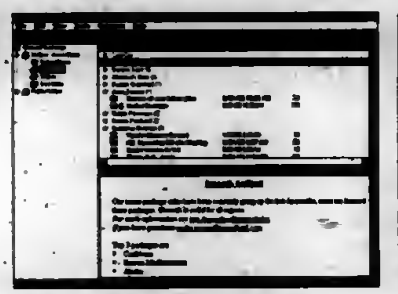
Groupware Showdown

BY GARRETT MICHAEL HAYES

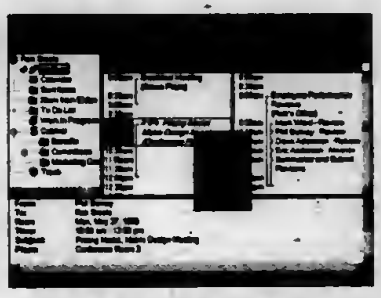
Notes still dominates the market, but Exchange and GroupWise are trying to define new approaches to workgroup computing



Lotus Notes 4.1



Microsoft Exchange 4.0



Novell GroupWise 5 beta

If you need the power to handle complex problems across several server and client platforms, Notes hasn't yet relinquished its position as a first choice in groupware. However, Microsoft Corp.'s Exchange, released in April, and Novell, Inc.'s GroupWise, being boosted by next week's scheduled release of Version 5, are clearly starting to narrow the gap in functionality without imposing the same administrative resource loads.

With major products competing for the same space — helping individuals in a workgroup or department share information — *Computerworld* commissioned a comparison of Lotus Development Corp.'s (www.lotus.com) Notes 4.1, Microsoft's (www.microsoft.com) Exchange 4.0 and the July 17 beta-test version of Novell's (www.novell.com) GroupWise 5.

Product

We found the following:

- Notes has the power to handle customized, complex applications, but it lacks ease-of-management and installation.
- Exchange is easy to install and administer and very flexible, but it is only just beginning to field customization tools.
- GroupWise has most of the same functionality as Exchange. But because of its close ties with Novell's Novell Directory Services (NDS), administration may be easier in a wide network but more problematic in a small homogeneous network.

Hayes is system controls manager at Client/Server Labs, Inc. (www.cslinc.com) in Atlanta, a primary test lab partner for *Computerworld*. He can be reached via E-mail at ghayes@cslinc.com.

Application vs. Infrastructure

A key aspect of the groupware choice is whether an information systems manager wants a particular application to help users carry out a specific task or whether he wants to build a generalized data-handling infrastructure.

Having grown from a database environment, Notes is clearly more application-oriented than the other contenders. Indeed, Notes treats messages as just a special sort of data within its database environment.

Notes' built-in data-handling tools — from the "navigators" that allow rapid customization of the user interface to its extensive capabilities for creating complex data-handling forms — confer great power to develop and deploy custom applications across a wide variety of platforms.

But these tools aren't nearly as easy to use as they are powerful. Messaging is intimately tied to applications in Notes, oddly enough making it more difficult to deploy as a messaging infrastructure if there is *not* a central application need. Notes messaging shines when it's embedded in a contract management application or a building construction program. Outside this specific group context, it's less like any number of electronic-mail packages.

Both Exchange and GroupWise are built on a messaging infrastructure. With their origins in E-mail, they emphasize the movement of information over content and control. Data is in the messages rather than messages being in the data.

Groupware showdown, *page 76*

This kind of editorial quality...

Computerworld

Computerworld Global 100

Computerworld Campus Edition

leads to these

Computer Press Awards
June 19, 1996

Best Technical Trade Magazine
Computerworld 8/28 & 11/6/95

Best News Story
Computerworld
"Lotus on the Block" 6/12/95

Runner Up
Best Investigative News Story
Computerworld "Ticket to Nowhere" 12/11/95

Runner Up
Best Technical Feature
"The Computerworld Guide to High-end Desktop PCs" 11/13/95

Folio's Magazine's Editorial Excellence
July 11, 1996

Winner: Computing Trade Publication Category
Computerworld 8/28/95

American Society of Business Press Editors – Nationals
August 2, 1996

Editorial Category

First Place: News Series
Computerworld "Win 95 Off and Running" 2/95 - 8/95

Second Place: News Series
Computerworld "Lotus on the Block" 6/12/95

Graphics Category

First Place: Computer-generated Infographic
Computerworld Client/Server Journal's "Document Management" 2/95

First Place: Opening Page Spread
Computerworld's In Depth Feature, "Swamp Thing" 8/7/95

Second Place:
Front Cover, Non-photo
The Computerworld Global 100 magazine 5/1/95

Second Place: Contents Page
Computerworld's Campus Edition magazine. 10/31/95

Honorable Mention:
Opening Page Spread
Computerworld's Management Feature, "Buried Alive" 12/11/95

American Society of Business Press Editors – Northeast Regionals
July 23, 1996

First Place:
Front Cover Non-Photo
The Computerworld Global 100 magazine 5/1/95

First Place:
Contents Page
Computerworld's Campus Edition magazine 10/31/95

First Place: Opening Page/Spread
Computerworld In Depth Feature, "Swamp Thing" 8/7/95

First Place: News Series
"Win 95 Off and Running" 2/95 – 8/95

Second Place: News Series
"Lotus on the Block" 6/12/95

Second Place: Opening Page
Computerworld's Management Feature, "Buried Alive" 12/11/95

Second Place: Regular Department
Computerworld's Management Feature, "Buried Alive" 12/11/95

Third Place: Regular Department
Computerworld "Training for MIS Failure 12/11/95

Honorable Mention:
Computerworld Client/Server Journal "DCE Delivers" 12/11/95

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Groupware Showdown

CONTINUED FROM PAGE 73

Exchange and GroupWise seem to have developed through the merger of formerly separate, widely used office automation tools. This makes them more suitable than Notes as basic infrastructure tools. Each uses widely understood views of the information world, which give users greater leverage of their experience with similar tools. For example, a user familiar with the tree structure of Window's Explorer can navigate Exchange's boxes and folders.

Although Exchange and GroupWise each have application development capabilities, neither has great breadth or richness of development tools. Forms design in Exchange is done with a Visual Basic application, making them platform-dependent, unlike Notes forms. GroupWise uses a comparable approach. More flexible tools may come with time, but at the moment, they are far too tenuous to seriously threaten Notes as an application platform.

Workflow vs. Business Process Control

All three packages claim to handle workflow processing. What isn't immediately obvious is how well they distinguish between workflow and business process control.

Workflow means ensuring that necessary information reaches the right people in the right manner and at the right time; it's essentially routing. Business process control involves routing but adds the verification and enforcement of business rules such as data validation and detailed access restrictions. None of the products handles business process control out of the box. Customized applications must be written or purchased to provide this.

GroupWise has some visually impressive tools for workflow, including a snazzy screen that allows you to graphically develop a routing control diagram and monitor the progress of any message along the path. Exchange provides simple workflow as well, without the graphical interface. In Notes, both simple workflow and true process control require that an application be designed or purchased.

Installation

None of the packages was designed to be installed by casual users. The installation processes for all three packages require information that comes only with significant experience combined with formal product training. Plan on investing in formal training or a consultant, especially with Notes. As with their user interfaces, each takes a distinct approach to the installation process.

GroupWise had the greatest physical demands for performing the installation process. In our case, it required the use of three computers. GroupWise requires a copy of NetWare 4.1 for NDS (included in the shipping product) and a Windows 3.x or Windows 95 station for administration. The server agents can be run on the NetWare server or an NT server. We installed on the NT platform to maintain a consistent server base.

Product Review

GroupWise's help screens were generally excellent and included diagrams of several typical configurations. The online help was especially important because written documentation wasn't available for the beta version we received. But working with three systems made it a challenge to keep track of precisely which component was being installed where. The installation also lacked any mechanism to check disk space prior to copying files, a serious problem when installing on existing NetWare servers.

At first, Notes seemed to have a simple and clean installation process, but difficulty arose because of some very peculiar choices of terms. Selecting "install on a network file server" prevents the installation of the server modules. This wasn't very intuitive.

Lotus' attempts to make Notes run on all platforms makes the installation process and the printed installation guide a bit difficult to work with. Because they were designed to cover similar procedures on several platforms, it was easy to become confused. Following Unix instructions while installing to an NT server can definitely cause problems. There were also several instances where instructions were simply wrong, though someone fairly familiar with Windows and/or NT administration could work around them.

Notes' online help wasn't as helpful as we would have liked. Again, because of Notes' multiplatform orientation, the help system doesn't use the built-in Windows mechanisms. Presented with a field we didn't understand, we couldn't find a way to simply have that field (or even the form we were viewing) explained. Though it seemed to understand the general context, help insisted on asking us what we were trying to do and then walking us step-by-step through a series of processes without ever adequately explaining the field in question.

Installation for Microsoft Exchange was unquestionably the simplest and most straightforward. In fact, it came the closest to being something an inexperienced administrator could accomplish alone. The written guide was very clear, with no obvious errors.

There are separate setup programs for the server and each client operating platform. Installation on the server automatically adds the required entries to the list of NT services. Control of the Exchange service is tied strongly to the NT domain administration and requires the creation of a "service account," which Exchange uses for its administrative access. We would like to have seen more explanation of what implications this account had for system security. It definitely should *not* have defaulted to the current account, which was that of the system administrator.

Installation of Notes took six attempts over a period of two days. GroupWise required three attempts over nearly the same time. Exchange, by contrast, required only two attempts and a total of three hours. (The first attempt failed only because NT server had been improperly installed.)

Administration

We performed basic administrative steps, including adding and deleting a user, adding and deleting several users, and creating and assigning group memberships.

The administration of the Notes users and data structures takes place within the Notes environment. There is no separate administration utility. Again, Notes' multiplatform architecture has an impact, resulting in a user structure that is operating-system independent. This is useful in a multiplatform environment, allowing Notes to present a unified user interface. But in a homogeneous network, poor administrator planning can result in serious confusion for end users. Because of this, network administrators must be particularly careful in assigning user names. Migration tools are under development for synchronization with NT domain services.

Any NetWare administrator will recognize GroupWise's enhanced version of the NWAdmin utility. GroupWise simply adds several configuration pages for each user. GroupWise domains and post offices become new icons in the familiar NDS tree.

Adding a mailbox for a user or group of users entails nothing more than filling in the identifier fields on these new pages. The administrator can add new users by making appropriate entries on the standard NetWare "new user template." The GroupWise installation procedure offered a list of existing users known to NDS to whom we could

Configuration:

All three packages were installed on a Dell Computer Corp. XE-5133-2 dual 133-MHz Pentium server running Microsoft Windows NT Server 3.51 with Service Pack 4. The server had 128M bytes of RAM and 9G bytes of disk storage. Workstations were all 66-MHz Intel Corp. 486-based IBM 300 desktop systems running Windows 95, Windows NT Workstation or IBM's OS/2 Warp Connect. All three packages run on NT Server and on Windows 3.1, NT Workstation and Windows 95 clients. In addition, Notes runs on Unix, OS/2, Windows 95, Unix and Novell's NetWare at the server and client levels and on Macintosh clients. Exchange also supports Macintosh clients, while Novell reports that GroupWise will run on Unix and Macintosh clients 30 to 60 days after release. The network was unswitched 10Base-T Ethernet, with support configured for both NetBIOS and TCP/IP.

assign mailboxes right away.

The only negative thing is that in a mixed environment such as the one we tested, it is necessary to maintain user information in two places (NDS and NT).

Exchange provides an Exchange Administrator program that is run from the console of the NT server. The various settings pages use the Microsoft tabbed notebook model. They were laid out well and logically structured. This made it easy to find the settings that apply to a particular task.

Despite the close ties to the NT Domains structures, Exchange doesn't automatically grant existing users a mailbox. Instead, Exchange provides a function within the administrator program that can do mass account creations from a text file. There is another function that creates such a text file from the existing list of NT users. Unfortunately, there aren't tools for making the extraction process selective. We were easily able to delete the unwanted accounts we created, but this could have been a serious chore in a larger installation. The extract file can be edited with a text editor, but this wasn't clear from the instructions.

From the User's Point of View

It is difficult to describe the look and feel of Notes, primarily because it is so highly customizable. In its initial state, the user sees a display of tabbed pages with boxes that represent individual databases. Click on a box, and you are launched into the database, where the visual models may vary widely.

But after a few seconds of configuration by an experienced administrator, the user may instead see what looks like his comfortable old personal information manager, with each database he routinely accesses shown as an icon. A few seconds more, and it's a tree-structured diagram. A customized application can also replace the common interfaces entirely.

All of this flexibility isn't necessarily a bad thing, but it can be disconcerting and makes it difficult to be certain how much you see is Notes itself, things done *with* Notes and things added *to* Notes. Looking at a single Notes implementation can be something like evaluating a quill pen by reading *The Merchant of Venice*.

Exchange instead presents a nice, fairly simple structural model based on the same inverted tree known from applications such as File Manager or Explorer. Drilling down through the layers or moving things within the structure uses the common interface tools such as clicking and dragging.

GroupWise, like Exchange, presents a simple tree-structured model that is based on the NDS directory tree. ■

HEAD-TO-HEAD-TO-HEAD

A features comparison shows Notes holding an edge in data management, but Exchange and GroupWise are making progress in several other areas

	Lotus Notes 4.1 www.lotus.com	Microsoft Exchange 4.0 www.microsoft.com	Novell GroupWise 5 beta www.novell.com
ADMINISTRATION			
Installation	Fair	Excellent	Fair
Configuration	Good	Excellent	Fair
Administration tools	Integrated	Exchange Administrator program	NWAdmin 4.11
User management	Good	Excellent	Very good
Group management	Good	Excellent	Excellent
Migration tools	Excellent	Good	Good
USER INTERFACE			
Presentation model	Presentation in databases, almost totally configurable with "navigators"	Similar to "file manager" or "Explorer" layout	"Universal Mailbox." All data is presented in trays, files and folders.
WORLD WIDE WEB PRESENTATION			
Using product to access Web	Excellent	Very good	Fair
MESSAGING			
Shared storage	Yes	Yes	Yes
Individual storage	Yes	Yes	Yes
Message routing	Excellent	Good	Good
Message threading	Excellent	Excellent	Good
Digital signatures	Excellent	Good	Uses Informs 4.1
Auto message processing	Very good	Very good	Very good
Internet E-mail	Good	Excellent	Good
DATA MANAGEMENT			
Replication/synchronization	Excellent: field level, selective	Good	Fair
Remote computing	Excellent	Very good	Good
Workflow routing	Fair	Very good	Basic*
Application development	Excellent	Good	Fair
Cross scheduling	In development	Excellent	Good

*Full workflow requires add-on GroupWise WorkFlow

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the WEBBING of the PRESIDENT

BY LESLIE GOFF

It seems like everybody from Pat Buchanan to Pat Paulsen has a Web site this year. The Internet may not swing the 1996 presidential election, but online virtual campaign headquarters are emerging as serious political tools, attracting nearly as much attention as the candidates themselves.

Internet surfers are spending a considerable amount of time at www.cg96.com and www.dole96.com, accessing on average 10 to 15 pages per visit, according to representatives for the Democratic and Republican parties.

Adam Sohn, director of technology for Bill Clinton and Al Gore's campaign, estimates their site generated 1 million hits in its first 10 days. And a campaign aide for Bob Dole and Jack Kemp, who declined to comment for attribution, says Dole's site, launched last September, had reached 9 million hits when it was replaced in August. Even more telling than the number of hits, he says, are the 6,000 campaign volunteers who signed up via the World Wide Web.

At their best, the presidential campaign sites reflect the most sincere populist intentions of the global village, leveraging the Web's interactive capabilities to reinvolve a dissatisfied or uninterested electorate in the campaign process. At their worst, the sites are interactive propaganda machines that can instantly bombard the 'net citizenry with any story campaign managers see fit.

The dichotomy arises from a need to straddle two sometimes conflicting agendas: a desire to engage users and yet control how the message is delivered. In many respects, the essence of the Internet — openness and accessibility — directly conflicts with the tenets of sound campaign strategy.

"Traditionally, politicians have tried to tailor their message to different interest groups, telling each what they think that particular group wants to hear," says Joe Dehn, an independent information systems consultant based in San Francisco (see story, page 80). "That has become harder with the 'net because it's a lot easier for individuals who want to see everything a candidate has said to access that information online."

So users can read all about Dole's technology vision in a special position paper posted at his site. But then they can surf over to Congress' server or other sites such as www.vote-smart.org and check out his voting record on technology-related legislation. And President Clinton's biography neglects to mention, among other issues, that he was defeated by Republican candidate Frank White after his first term as governor of Arkansas — a fact that's easy to track down at several Web sites.

"We're not attempting to fool ourselves into thinking the Web is a way to get around the mainstream press, but it does offer a forum for us to tell our story, to articulate our message," Sohn says. "We'd like people to see the president on TV or in the paper, then turn to the Web site to see what the campaign thinks of the issue. They don't have to wait for CNN or C-SPAN, but can come here as an informative vehicle to check

Webbing, *page 80*

WEBBING

CONTINUED FROM PAGE 79

into the campaign every day."

Translation: If the campaigns can get voters to visit online, they can shape, tell and spin the story without intermediaries. Mike Riley, executive producer of AllPolitics (www.allpolitics.com), the Cable News Network/*Time Magazine* site for inside-the-beltway news and discussion, says the key "lies in creating communities of people who return to the site. Controlling information and image is 99% of the game."

According to Riley, the headstrong libertarian users who characterize the Internet make an elusive, sought-after prize. "The 'net decentralizes authority and power, and that's not an advantage to candidates in a binary political system," he says. "But a high percentage of registered voters on the Web are swing voters — those not satisfied with either party who want their vote to make a difference. If the major parties can figure out how to connect with these people, there's probably an electoral benefit."

The major parties' sites effectively focus on aspects of their candidates and campaigns intended to appeal to the Web's demographics: younger, hipper, more educated, more affluent and more politically aware than the national average.

The Clinton/Gore site, launched in July, strikes a presidential tone. It features stately photographs of the incumbents and focuses on the administration's accomplishments in the first term. A clickable map, for instance, claims to show how new legislation has affected families state-by-state. The site also has a lighthearted side, with downloadable campaign buttons and an animated graph that depicts the falling national budget deficit.

If the incumbents' site is *American Playhouse*, the challengers' site is *Pee Wee's Playhouse*. It's intent on capturing the festive spirit of a campaign rally, with red and blue bunting and a strike-up-the-band atmosphere. It's full of fun and games, including a program that lets users create and send electronic picture postcards to lobby friends to vote for Dole and Kemp.

Both sites include the usual press releases and position papers. Notably, neither offers an electronic-mail outlet to reach the

candidates directly. However, the new Dole/Kemp site does ask users to rate the importance of issues covered by each online position paper. On the other side of the aisle, users can E-mail the president and vice president via the Welcome to the White House page (www.whitehouse.gov/WH/Welcome.html).

The ability of either campaign site to garner votes on Nov. 5 remains a question for the postelection polls, but the general consensus is that they are dry runs for the 2000 election. By then, both the technical infrastructure and the user numbers will be in place to make campaign Web sites as potentially compelling and far-reaching as sound bites on the nightly news.

"Any candidate who wants to get their message out and doesn't see the Internet as important is ignoring it at their own peril," says Paul Nichols, Internet coordinator for the Perot Reform Committee (www.reformparty.org/index.htm), whose Web site allowed party members to cast votes for Ross Perot or Dick Lamm via E-mail during its August convention. "You just can't look at the number of people getting Internet access every month and say it's not significant." ■

Goff is a freelance writer in New York.

Uncle Sam wants you

IS volunteers can make the difference in online campaigning

IS professionals are in a unique position to help online campaigning realize its true potential. Campaign Web sites can capture voters' imaginations, but the real potential of the Internet to capture votes has yet to be exploited.

"We need politicians to be more savvy and to make a commitment to be more accessible," says Marla Johnson, CEO of Aristotle Internet Access, an Internet service provider and Web design and consulting firm in Little Rock, Ark. "If that commitment is made, the 'net will have a huge impact on politics in the future. What we need is IS people volunteering for the campaigns."

A technology champion within a campaign organization can be particularly effective at state and local levels, says Joe Dehn, an independent IS consultant based in San Francisco and the volunteer webmaster for the Libertarian Party. "A lot of candidates for lower offices depend on volunteers for all their services," he says. "And unlike presidential campaigns, those races are not funded by the government so the volunteer effort is much more important."

Aristotle, for instance, created an online forum — Arkansas Politics 1996 (www.aristotle.net/politics96/index.html) — to establish a dialogue between voters and candidates for state and local office. It features a Town Hall, where voters can E-mail questions to the candidates; the Spit 'n Whittle Club, a chat server; the Whistle Stop, where candidates can post briefs; the Soap Box, a bulletin board; and a biweekly Barber Shop Poll on local issues.

Although the site drew close to 1,000 hits per week, even in the quiet period between the primaries and the major parties' conventions, state and local candidates have been slow to hop on the bandwagon. Only a handful have participated in the Town Halls, though quite a few — including President Clinton and Bob Dole — have taken advantage of the Whistle Stop.

"The truth is, if there were enough candidates responding to these E-mails, this site would be going gangbusters," Johnson says. "But if they silently agree not to participate, grassroots sites like this one will fall flat. We need to motivate the candidates to respond."

Volunteers from the IS profession can get the ball rolling by changing the perspective in a campaign organization whose candidate may have negative impressions of the Internet.

"Elected officials have been told that the Internet is rife with pornography and terrorism and instructions on how to make bombs," says Paul Nichols, Internet coordinator for the Perot Reform Committee. "There are those who do not understand the technology at all. If you have the skills to apply technology creatively to a campaign and can show your candidates the benefits, you've done more than your fair share."

— Leslie Goff

Spirit of '96. Joe Dehn, an IS consultant, serves as webmaster for the Libertarian Party, whose virtual campaign organization is composed almost exclusively of volunteers.

Computer Careers

Web sites for career-minded IS professionals / *By Leslie Goff*

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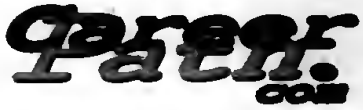
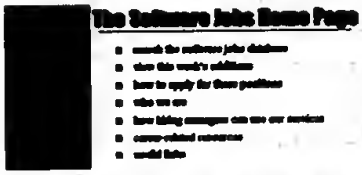


CareerPath.com

www.careerpath.com

Quickly and painlessly search the classified ads in 17 major daily newspapers, including *The New York Times*, the *Milwaukee Sentinel Journal* and the *San Jose Mercury News*. CareerPath.com gives users the real thing — local help wanted ads, an invaluable resource to job seekers who want to relocate. With two weeks of classifieds from each paper, the World Wide Web site consolidates close to 100,000 want ads in one place.

Select as many newspapers and job categories as you wish, and the engine will search them simultaneously. You can also customize a search with the optional keyword feature. For example, you can tell the engine to recognize at least one or all the keywords — an advantage if you want to search the ads by a listing of skill sets, such as packages, operating systems or hardware. The "computer" category, combined with those keywords, yielded hundreds of information systems jobs from a half-dozen papers. You must register to read the ads, but it's free.



The Software Jobs Home Page

www.softwarejobs.com

This IS-specific job-hunting site is a tremendous resource. The site is sponsored by Allen Davis & Associates, a specialized national search and placement firm. The site's logical simplicity and clean design will appeal to its intended audience, and its content is consistently useful at every layer. Users can review job listings by four major software development categories, each of which has its own newsletter, or by using open keyword searches.

The newsletters, which are accessible from the home page, cover SAP, Windows, graphical user interfaces and relational database management systems. Each newsletter contains job listings and a mix of well-written, editorial material that can be acted upon.

The site also offers users the chance to peruse only new job listings, which are updated weekly — a time-saving bonus for those who check the site regularly. In a recent, sampled week, more than 100 new listings were posted.

Job listings contain the title, location, compensation, required experience and other information. Unfortunately, users can't apply directly for the jobs listed. Allen Davis & Associates is the conduit to which you submit your resume. If its placement specialists feel there is a match, they will call you for a telephone screening.

Hi-Tech Careers & Lifestyles

www.hitechcareer.com

Ignore the name of this site. You'll find next to nothing about high-tech careers and even less about high-tech lifestyles.

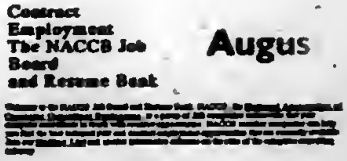
This is a commercial site that promotes The Professional Exchange, a floating IS job fair hosted in several U.S. and Canadian cities. And this site misses few opportunities to make a pitch.

Having said that, if you're willing to maneuver around a bit, you can use the site to find timely and significant IS job opportunities.

Major employers "attending" include Booz Allen & Hamilton, Inc. Capital One Financial Corp., Citibank Credit Services, Inc., Federal Express Corp. and U.S. Healthcare. (They're listed if they have participated in a recent job fair).

The site's search capabilities are limited, but you can point and click your way to relevant information.

Unfortunately, you can't submit a resume online, nor can you send electronic mail to employers. Its real value is to expand your list of potential opportunities and contacts. And a Professional Exchange may come to your city soon. You'll have no trouble uncovering that here.



NACCB Job Board and Resume Bank

computerwork.com

If you're looking specifically for contract positions, this intelligently organized site is the place to find updated listings. It's also a smart place to post your resume. The site is sponsored by the National Association of Computer Consultant Businesses (NACCB), which comprises 250 computer consulting firms nationwide that could potentially use the site to find job candidates. (The NACCB has a separate, linked site at naccb.resourcecenter.com.) Its search capabilities — by keyword, location and job title — are particularly useful if you know exactly which type of project you want to tackle next. They are also flexible enough if you're shopping on an I'll-know-it-when-I-see-it instinct.

But finding what you want can be a hit-or-miss proposition. The keywords work better when you use specific names of packages or operating systems than when you use general concepts. And although the NACCB's membership is nationwide, the job listings here aren't necessarily.

Posting your resume here is easy. If you haven't had time to update yours recently, a form at the site prompts you to enter your vital statistics and skills sets.

Computerworld Careers Home Page

careers.computerworld.com

We won't comment on the content — obviously, we think it's worthy — but *Computerworld*'s Careers Home Page merits mentioning because it offers many of the same features reviewed here: online job search capabilities and resume posting; an automatic electronic-mail agent that notifies users when job matches are found; and a deep archive of *Computerworld*'s career-related articles, which can be searched by keyword.

Let us know what you think, and we will include your responses in an upcoming Cool Career Sites column. ■

Goff is a freelance writer in New York.

Computer Professional

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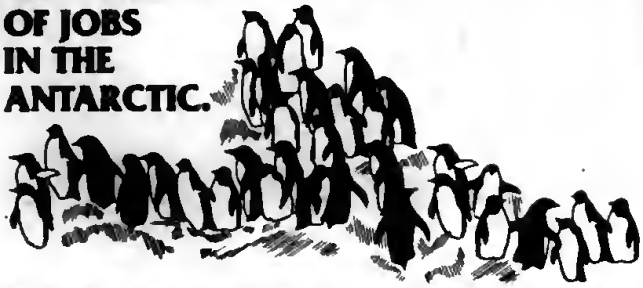
GET A BIRD'S-EYE VIEW OF JOBS IN THE ANTARCTIC.



PROGRAMMER/ANALYST - Experience in MIS system analysis, using multiple platforms and preferably with Advanced Revelation or Sybase.

ELECTRONICS TECHNICIAN - Background in CATV, digital equipment, computer and communications software. Experience in electronics, diagnostics and communications equipment power systems.

PROJECT ENGINEER - Planning and executing engineering, construction and maintenance projects including supervision. Professional Engineer's registration desirable.

SENIOR ANALYST - Background in MIS, systems analysis including multiple hardware platforms with an emphasis on Telecommunications.

NETWORK ADMINISTRATOR, VESSEL OPERATIONS - Knowledge of UNIX, Mac communications issues, electronic mail and VAX equipment. Support of NetWare LANs.

SENIOR NETWORK ADMINISTRATOR, MARINE RESEARCH VESSEL - Installation, maintenance, modification and administration of shipboard LAN and DAS. Knowledge of UNIX, Novell, and Macs. Irix, satellite, terrestrial and data communications experience.

Most positions require a degree in Computer Science or equivalent work experience.

These positions require deployment to Antarctica. Therefore, passing strict physical, dental and psychiatric examinations after an offer of employment is required. U.S. citizenship is also required. Salaries are based on Denver-area salaries. Please submit a typewritten cover letter/resume to:

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Englewood, CO 80112
Attn: Human Resources
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EOE

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Kansas City Area Opportunities

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Provide effective support for internal customer desktop systems and Microsoft application software. Work with clients using desktop applications and file service on Windows NT server equipment for workgroups, Windows NT and Windows 95 operating systems and Microsoft application software. Support notebook computers, laser printers, fax machines, modems, telephones and terminals. Provide support for help desk service level.

Four year bachelor's degree required in Computer Science or related major with a minimum of 2 years directly related experience. Demonstrated mastery of current technology including PCI, ISA, EISA SCSI, Pentium, PC DOS 6.22, Windows 3.11, etc. Microsoft MSCE desired. Strong team player with effective interpersonal skills

Business Systems Analysts

Gather/document requirement, perform analysis, design, develop, integrate and implement functional area business and related infrastructure.

Four year degree in related field plus a minimum of 3 years experience in systems analysis, design and development. Current demonstrated proficiency in PC concepts and Microsoft Office packages. Effective analytical, interpersonal skills coupled with strong communication ability needed.

Operations Analysts

Define, implement and monitor production procedures for AS/400, UNIX, desktop, HP and Mainframe systems. Accountable to infrastructure functions for the definition and monitoring of new modified business solutions.

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- **Client Services Manager** - Client Services responsible for maintenance of customer service levels in support of business technology. Manage help desk and desk top assets (PC's modems, etc) and manage acquisition of microcomputer hardware.

Both positions require a four year degree plus a minimum 5 years directly related experience in leadership role preferably in a manufacturing/engineering environment. Outstanding technical ability plus effective leadership skills and communication ability necessary.

For consideration, please mail or fax your resume to: AlliedSignal, Human Resource I/S, 400 N. Rogers Rd, Olathe, KS 66062, FAX (913) 791-1319.

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If you're unable to attend, please send your resume with cities of interest to: Career Fair Coordinators, P.O. Box 1456, Dept. CW9/2, Coppell, TX 75019
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PROGRAMMER ANALYST (2 Openings) (Ref# 100096). Plan, develop, test and document computer programs, applying knowledge of programming techniques & computer systems, evaluate user requests for new or modified programs to determine feasibility, cost & time req'd., compatibility with current system & computer capabilities; consult with users to identify current operating procedures & clarify program objectives, formulate plan outlining steps req'd. to develop program using structured analysis & design, convert project specifications, using flowcharts & diagrams into sequence of detailed instructions & logical steps for coding into language processable by computer, apply knowledge of computer programming techniques & computer language, analysis, design, development, testing & implementation of applications; working on a variety of platforms to include using IBM PC, AS/400, DOS, Windows, Visual Basic, Novell Netware, Foxpro, Spread VBX, Microhelp VB Tools, Showcase ODBC and MS Access. Reqs: Bachelor's in Computer Science, Systems Analysis, Computer Information Systems, Computer Engineering, Electrical Engineering, Electronic Engineering, Mathematics or its equiv. in ed & exp., 2 yrs. exp. in job offered or 2 yrs. exp. in related occup. such as Programmer, Programmer Analyst, Systems Analyst, Software Engineer, Senior Engineer - Hardware or Consultant. Will accept 3 yrs. of college ed. plus 3 yrs. exp. in job offered or in related occup. in lieu of req'd. ed. & exp. Must have some related exp. including analyzing, designing & developing applications & using each of the following: DOS, Windows, Visual Basic, Novell Netware & Foxpro. $48,396/yr. 40 hrs/wk, 8a-5p. Send resumes to 7310 Woodward Ave., Rm. 415, Detroit, MI 48202 & include Ref # Employer Paid Ad.

Software Engineer to design, develop and document s/w interface between Expert analysis System (EAS) and Tracor telemetry s/w allowing Matlab (a subsystem EAS) to process telemetry data for spectral analysis, design and develop Graphical User Interface (GUI) Control Window(s) for Tracor Telemetry Analysis s/w allowing the user to spawn the s/w for display and printing, use GEC-Marconi data to establish the Instrumental Test Range (ITR) tape format, design and develop a methodology to extract data from 8mm external tape drive and save extracted ITR data into a PV-Wave binary plot file, design, develop and document GUI Control Window(s) for the control of the ITR extraction s/w allowing the user to extract, plot, print and save ITR telemetry data, design and develop GUI control window(s) for data analysis and display (utilizing PV-Wave tool) to include plot label control, plot size control, color strip chart plot capability, solar surface plot capability, algebraic plot variable manipulation, integration and differentiation of plot variable manipulation, zooming of plots and GUI window for peripheral control; design, develop and document Dynamic Graphics Display to perform real-time plotting for specified variables as results are produced in real-time Multiple Degree of Freedom (MDOF) missile system simulation. Require Bachelor/equivalent in Comp. Sci. Eng. or Comp. Eng. and 1 yr. exp. in duties described above or as a Software Developer or Software Eng. which includes designing, developing and documenting GUI's. 40 hr. wk. 9am-5pm. $34,600/yr. Must be authorized to work in U.S. Send resumes to M. Thomas, Alabama State Employment Service, 2535 Sparkman Dr., Huntsville, AL 35810-3825. Reference Job Order 6AL-6011408. E.E.O.

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Design, develop and integrate various Oracle vertical applications. The Senior Applications Engineer will provide team direction/planning, ensure project task completion and quality assurance. Will be an integral part of the analysis, design and build phases for several versions of the applications. Will lead the integration of externally/internally developed large and complex applications. Five years' software development and integration experience; demonstrated project management/analysis skills; a background in planning work; and providing direction to programmers are required. Knowledge of RDBMS, associated 4GL/GUI tools, SQL and client/server experience also required. Junior-level openings require at least 2 years of related experience.

Platform Technology Engineers
The Platform Technology Group is responsible for making all Industry Application Division products available on initially targeted server platforms: DEC/Alpha, Sun/Solaris, HP/UX and IBM/AIX. Client platforms, Windows 95 and Windows NT. Prior porting experience as well as C++ skills are preferred.

Quality Assurance Manager
Will manage/lead the entire quality initiative for the Industry Application Division. This will include executing quality assurance test suites; recommending development procedures; participating in design reviews; and leading us towards ISO and SEI quality certification.

Systems Infrastructure Manager
Oversee the entire life cycle of technical integration activities of the Consumer Packaged Goods (CPG) product (including OBA, integration tools, installation, testing, simulation and troubleshooting). Requires experience in the development/integration of large scale application systems with heavy focus on relational databases.

Applications Engineers
Will analyze new requirements for the Oracle receivables application for CPG; document new designs/procedures for new features, and build/test new features. Must have familiarity with receivables/financials applications (Oracle preferred) and experience with systems analysis/design. Knowledge of financials in the CPG industry a plus.

Database Administrators
Will install/maintain Oracle and vendor-supported databases, applications, tools and products. Will also develop/implement performance tuning strategies and comprehensive backup solutions. Must have experience with Oracle financial applications and strong UNIX skills.

Quality Engineers
Define, build, implement and execute software test plans for database applications in White and Black Box environments. Must have software testing experience as well as experience in any of the following: UNIX, Windows NT, C/C++, test automation tools or metric generation software, test scripts or quality methodologies.

Technical Writers
Must have significant development software documentation experience with all of the following: Interleaf, Framemaker, UNIX and MS Word. Exceptional interpersonal skills are essential.

Diagnostic and Defect Resolution Engineers
Requires prior experience using Oracle (or similar) databases, applications and/or tools. A proven track record dealing with customers, product support groups and development organizations in high pressure situations is essential. A willingness to work on source-level debugging a definite plus. Experience with C++, UNIX and Windows preferred.

Product Marketing
Gather information to define strategy and requirements for vertical market product releases; recommend direction of future releases and establish project policy; justify product strategy, and communicate timing and delivery of development and documentation activities. Senior-level openings require 7-10 years' experience in product marketing or a related field. Junior-level openings require 2-6 years' experience. Demonstrated product management abilities on complex/partnered products and a solid background in IT/IS are essential. Strong people and matrix management skills are necessary.

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Develop high quality product requirements and marketing plans for our worldwide higher education efforts. Will analyze legislation, regulations, standards and competitive products; define requirements for software, documentation and educational materials, support developments; and test software, documentation and educational materials. Must have experience in software-supported financial management operations (preferably in a higher education environment). CPA preferred.

Senior Software Engineer
Will design/implement key modules of integration objects (a project to develop a distributed object framework for "componentizing" applications). Will also lead group in resolving technical roadblocks and drive the development process. Must have experience designing and coding shrink-wrap software products. Experience should include: object-oriented design, C++, Corba, Windows NT, and front-end applications.

UNIX Systems Administrators
Requires 3 years' experience in desktop UNIX support. Solaris environment, customer service skills and project experience essential.

Development Managers • Lead Analysts • Designers • Programmers • Technical Architects (Houston or Denver)
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All positions require a Bachelor's degree (or equivalent), 2 years' related experience, excellent communication and self-motivation skills, as well as the ability to interact in a team environment.

Oracle Corporation offers outstanding compensation and unparalleled benefits. If you are qualified, please send your resume (indicating position of interest) to: Oracle Corporation, Attn: E. Hoolhorst, 500 Oracle Parkway, Box 659307, Redwood Shores, CA 94065. E-mail (preferred): ehoolhorst@us.oracle.com in ASCII text or fax (415) 506-7102. Principals only. No phone calls, please. Equal talent will always get equal opportunity.

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Ideal candidates will have experience with in-house application development using data models, process models, and component-based methodologies. The technical environment includes: IBM 3090, ESA, COBOL II, CICS, Visual Basic, DB2, CSP, C++, Novel Network, and IEF In-house training to support IEF development activities.

We offer a competitive salary and benefits package. Resumes may be submitted to: Administration, InterRegional Common Systems, 4900 S.W. Meadows Road, Suite 300, Lake Oswego, OR 97035. EOE/AA. Minorities, women, disabled persons, and veterans are encouraged to apply. Principals only, please.

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- **Security** - You will develop, implement & support all information security related policies & procedures. Requires Bachelor's degree or equivalent exp & 8 yrs. experience in computer systems security
- **Network Engineering** - You will perform systems programming duties for the MVS/ESA environment including installations, maintenance, customization and support of IBM & Non-IBM system software products, identify/implement improvements to the MVS mainframe environment and provide on-call support as required. Requires Bachelor's degree in CS or MIS or equivalent work experience, proven track record in installing, debugging, customizing & supporting an IBM MVS mainframe environment, & excellent organizational, planning & communication skills. Must have exp. in but not limited to SMP/E, JES2, MVSCP, IOCP, DFSMS, UTAM, CICS, RAMAC, Millinium & Medipac.

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You will be responsible for mainframe computer resource utilization management, capacity planning and overall system performance tuning. Requires 8 yrs. experience in large-scale IBM mainframe capacity planning and system tuning. Bachelor's degree preferred.

We offer a competitive salary and benefits package. Mail/FAX/E-Mail resume to: **PHS, Human Resources, Attn: BMS/IS, P.O. Box 26666, Albuquerque, NM 87125-6666, FAX (505) 841-1375, E-Mail: PHSHR@PERS1.PHS.ORG.** EOE

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- **COBOL, DB2 Programmer Analysts (Job Code COB)**
  BusinessObjects experience preferred
- **Millennium Programmers (Job Code MIL)**
  With DBS GL or A/P
- **Smalltalk Specialists (Job Code SMA)**
- **Marketdata Specialists (Job Code MDS)**
  Experience with Telerate/Ron/TIBCO
- **Encina/DCE Middleware Specialists (Job Code MID)**
- **Datawarehousing, DB2 DBA (Job Code DBA)**
- **Remedy Specialists (Job Code REM)**
- **Sybase, C Developers (Job Code SYB)**
- **UNIX System Administrator (Job Code USA)**

NEWARK, DE
FINANCIAL SERVICES ENGAGEMENT

- **COBOL, DB2 Programmer Analysts (Job Code COB-N)**

Forward your resume and salary history (indicating specific job code) to: **BPMTM002, Andersen Consulting, 1345 Avenue of the Americas, Suite 943A, New York, NY 10105. Fax: (212) 708-8066.**

IRVINE, CA
TELECOMMUNICATIONS ENGAGEMENT

- **VAX COBOL Programmer Analysts (Job Code LA/AD)**

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PHOENIX, AZ • FT. LAUDERDALE, FL:
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- **Application Architect (Job Code AA)**
- **Application Developer (Job Code AD)**
- **Technical Support (Job Code TS)**
  Requirements: Experience with MVS, COBOL II, DB2, and CICS.

Forward your resume and salary history (indicating specific Job Code) to: **BPMCPW0002, Andersen Consulting, 1 Renaissance Square, 2 North Central, Suite 900, Phoenix, Arizona 85004. FAX: (602) 495-6722**

MIAMI, FL
UTILITIES ENGAGEMENT

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Develop and maintain account plan and strategy. Experience in a technical environment with DB2/CICS/COBOL II, and customer service are a plus.

Year 2000 Project Lead
Will assist in development and execution of year 2000 strategy

Team Lead CICS Reengineering
Review existing processes, design new administration processes in client server environment. Experience with reengineering in a Mainframe CICS/RACF, client server environment is required.

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Plan and estimate validation effort, and validate product functionality. Functional testing required. Security mantagement, UNIX and Lotus Notes experience are a plus.

Programmer/Analyst Application Management
Analyze system modification requests, code and test systems modifications, production support for batch and online applications. DB2/CICS/COBOL II is required.

Forward resume indicating position of interest and salary history to: Andersen Consulting, Attn: KC BPM Recruiting, 1 Biscayne Tower, Suite 2900, Miami, FL 33131. FAX: (305) 358-3122

NASHVILLE, TN
HEALTHCARE ENGAGEMENT

Applications and Interface Engineers, Technical Analyst

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Will support IDX General Practice Management.

PeopleSoft Financials
Will support PeopleSoft financial applications.

Surgery Management
Will support ESI Orbit application.

Clinical Application
Will support laboratory, radiology and clinical management systems.

Interface Engineer
Will support and develop HL7, ANSI X.12 and proprietary application interfaces using Hublink Interface engine.

Technical Analyst
Will support administration UNIX and Windows NT platforms.

Forward resume indicating position of interest and salary history to: **Andersen Consulting, Attn: Account Manager, 345 Mainstream Drive, Suite 350, Nashville, TN 37228. FAX: (615) 242-6134**

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PRODUCTS ENGAGEMENT

- **Software Applications Team Leaders (Job Code SATL)**
- **Senior Programmer Analysts (Job Code SPA)**
- **Programmer Analysts (Job Code PA)**
  Requirements: 4-7 years experience with DEC/VAX (VMS, RDB, CDD, FORTRAN), Oracle (Version 6 or 7), Powerbuilder, Ada MarkMan.

Forward your resume and salary history (indicating specific job code) to: **Mr. R. Haber, Andersen Consulting, 1345 Avenue of the Americas, Suite 943A, New York, NY 10105. FAX: (212) 708-8066.**

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DATA ADMINISTRATION

Experience with Information Engineering methodology and/or CASE tools a must. RDBMS experience with ORACLE or DB/2 required. Requires logical data modeling skills, relational data management, and decision support systems experience.

DATA WAREHOUSE DESIGN

Requires experience with relational database design, relational theory, SQL, data modeling techniques, CASE tools, and decision support skills.

TELECOMMUNICATIONS ENGINEERS

Minimum of 5 years experience in a network environment using Token Ring and/or Ethernet topology. Experience with analysis, design, implementation of large scale networks including: IPX/SPX, SNA, TCP/IP, Novell Network, GroupWise administration and Windows NT Server, etc.

PERFORMANCE MANAGEMENT

Manage performance, tune and plan for a CICS, COBOL application online/batch cycle; knowledge of SAS, Strobe performance analysis tools; MVS, VSAM, JCL, COBOL/COBOL II, CICS.

Allstate offers an exceptional compensation package consisting of life, medical, dental and vision insurance plans, a company-paid pension plan, 401K/profit sharing plan, and Work/Family Benefits including child/elder care, adoption, and education planning and assistance, employee assistance program, flexible spending accounts, legal care plan, long-term care and tuition reimbursements.

If you're a person who thrives on change and is stimulated and motivated by the first-time challenges that occur in a growth environment, then...being in good hands is the only place to be.™ Touch your future today – e-mail your resume to: injobs@allstate.com or mail/fax to: Allstate Insurance Company, Information Technology Selection Team, Attn: EACWITT/96, 2775 Sanders Road, Suite A-1, Northbrook, IL 60062. FAX: (847) 326-5757.

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Allstate is an equal opportunity employer and we encourage men, women, the disabled and veterans to apply.

Operating Systems Programmer

The WI Dept of Administration (DOA); Division of Info-Tech Services; Bureau of Technical Support; Madison. Start at $53,128 per year with an increase to $54,102 after six months, plus excellent benefits. Relocation expenses may also be paid. DUTIES: Perform installation and technical consultation for complex operating systems software products such as MVS/ESA, JES2, VTAM, NETVIEW, ACF2, etc. Tune these software products to ensure optimum utilization of computer resources. Act as backup to the JES2 support. Perform project leader tasks relating to planning and implementation of cost-efficient, state-of-the-art systems. Well qualified candidates will have several years experience in planning and implementation of operating systems products. KNOWLEDGE REQUIRED: Advanced level knowledge of MVS/ESA, JES2, VTAM and ACF2. Performed installation processes using CBIPO/PDO. Skilled in the use of SMPE, IPCS, TSO and ISPF/PDF. Excellent problem solving techniques, organizational skills, interpersonal skills and effective verbal and written communication skills. To apply: submit a detailed resume outlining your relevant training and experience to: Patricia Thyssa, DOA Personnel Office, 101 E Wilson St, 5th Floor, P.O. Box 7855; Madison, WI 53707-7855; (608) 266-1524; FAX (608) 264-8600, E-mail: thyssp@mail.state.wi.us. First review of resumes will occur on September 20. Applications will be accepted until the needs of the service are met.

State of Wisconsin

GROWTH OPPORTUNITIES FOR INFORMATION TECHNOLOGY PROFESSIONALS

SCB is a rapidly growing, comprehensive provider of value-added information technology services to governments, public utilities, Fortune 500 companies and other large commercial clients. The Company is seeking dynamic individuals with relevant experience for immediate long-term opportunities as Consultants, Programmers and Analysts in its locations across the country.

Desirable skills for Programmers and Analysts include the following:

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- DB2
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- ORACLE
- ASSEMBLER
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SCB is a publicly traded company listed on the Nasdaq Stock Market. The Company offers employees competitive salaries and benefits including stock options and incentive-based awards; leadership opportunities through a decentralized management structure and unique career path opportunities resulting from being a rapidly growing company. Learn more about SCB at http://www.scb.com

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We continue to grow and expand our service offerings through the following Practice Areas:

- **Client/Server Solutions**
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- **Microsoft Solutions/Networking**
- **Financial Applications**
- **Groupware**
- **Internet/Multimedia**
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We provide career paths in both technical and managerial directions to help you reach your potential. We believe in extensive training, career mentoring and incentive-based compensation with comprehensive benefits. When you join The Revere Group, you will find challenge, support, energy, talent, trust, integrity and leadership. With our momentum and successful track record, we are positioned for excellent growth. Revere's employees are its most valued asset. We help you stay in step. Come explore the opportunities and partner with us!

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decades of excellence and leadership, we have opportunities for technical professionals in our Houston office. In the last two years we have more than doubled our size.

PL/1, IMS, TELON - a plus - LT Opts Maint & Year 2000

COBOL DB2/CSP or CICS - Facilitate conversion to new sys

VISUAL C++/C++ - OXC OLE & MFC a must. Must have back-end experience with ORACLE or SQL*SERVER. Client interaction. New dev. Sr. Pstn

POWERBUILDER - Version 4.0 preferred with SQL*SERVER or ORACLE on the back-end. (Multi. Post)

MS EXCHANGE - Lotus Notes. MS Exchange conversion project

ORACLE - Heavy end user interface req'd. FORMS, REPORTS, database programming and UNIX shell scripting

VISUAL BASIC DEVELOPERS - with back-end experience a must. Must have either Oracle or SQL*Servers. Formula One experience a plus. Experience with OLE, 3rd party controls, DLLs and BDE links a must. Strong SQL experience a plus

LOTUS NOTES DEVELOPERS 4.0 - Design, gather requirements, etc

As a full time RCG/IT employee, you will receive a generous compensation package including salary, commissions, bonus potential, 401(k) plan, comprehensive medical coverage, disability insurance, training, relocation assistance and much more.

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Candidates should possess a BS in CS, MIS or related discipline with entry level to 2 years of experience. Seeking consulting, analysis, design, construction, implementation and support experience with applications software. Knowledge of a combination of the following also required:

• DB2 and/or Oracle • VS COBOL II and/or C/C++ • VB4 • HTML • CASE Tools/GUI (FOUNDATION preferred) • Windows NT • UNIX • VMS • MVS • TSO/ISPF • DYL • PWB • PVCS • Excel • Word • Access • Visual Basic • TCP/IP

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Positions are now available for candidates who possess a BS in CS, MIS, Engineering or related discipline and 2+ years of applicable experience in one of these areas:

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• Novell • UNIX •TCP/IP • NT Servers • E-mail, printing & backup support • CNE desirable

Systems Support
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Telecommunications Support
• VRU support • Large customer service center

Security/Firewall Administrator
• Firewall construction • UNIX Administration • Scripting • Routing • TCP/IP & IPX protocols • C

Production Systems Support
• Production control • QA • Job scheduling • UNIX • Mainframe (MVS)

OpenTime Support
• HP-UX/HP OpenMail • LAN/WAN • Windows/Windows NT • UNIX servers • TCP/IP • IPX • NFS

Oracle DBA (Senior-Level)
• Oracle administration, maintenance, design installation, integration & tuning • Database strategy development • Client/server • MVS • HP-UX servers • Windows NT workstations • DB2 • Informix • IDMS

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Information Technologies

Mainframe/Florida

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Fax: 813-971-0532
bpittel@tmp.ajilon.com

Sue Ellen Farley
9424 Baymeadows Road, #160
Jacksonville, FL 32256-7990
Ofc: 800-758-2342
Fax: 904-739-8003
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6600 N. Andrews Ave., #227
Ft. Lauderdale, FL 33309-2134
Ofc: 800-877-9745
Fax: 954-492-0100
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AJILON

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• Ability to manage bugs of small systems.
• Must have the ability to utilize CICS, COBOL, COBOL II, DB2, JCL, SQL and LUK.2.
• A 45 hour work week, 7:30 a.m. to 5:30 p.m. Monday through Friday.
• A minimum of two years experience programming in a mainframe/client server environment.
• A four year computer related degree or equivalent experience.

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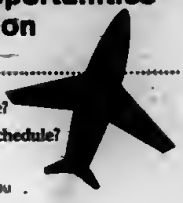
• Electronic Data Interchange (EDI) allows a shipper and carrier to conduct routine business transactions electronically. It is faster and more efficient than manual exchange of information. It improves our service to our customers by eliminating the need for phone calls to track shipments. It also benefits J.B. Hunt by eliminating printing, sorting and mailing of freight bills to those customers who can receive electronic invoices.

The Programmer/Analyst position has a salary of $47,900 per year.

Please apply at: Employment Security Department, P.O. Box 19, Rogers, AR 72757-0019. EOE.

Information Technology Opportunities at the Dulles Airport Location in Northern Virginia



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SENIOR PROGRAMMER ANALYST

This individual will assist us in converting our mainframe applications to client/server, as well as developing new applications for the airline industry. To be considered for this position, an applicant should have the following qualifications:

- 3-5 years C++ experience
- Proven background as a Technical Lead
- Has participated in the creation of standards and practices for a distributed computing environment
- GUI Design experience
- OO Lifecycle Development is a plus

PROGRAMMER ANALYST

Initially, these individuals will support and enhance our existing MVS applications. However, this is an excellent opportunity to migrate your career to the client/server environment. To be considered for this position, an applicant should have 2+ years experience in the following:

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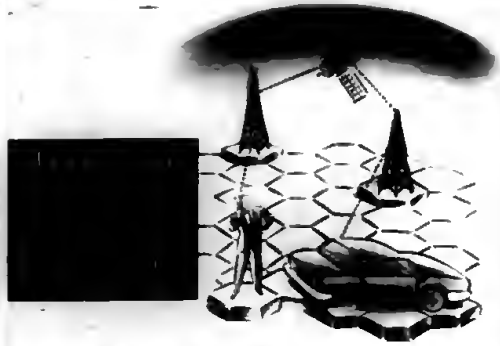
- CICS or IDMS
- DB2 or IDMS
- MVS JCL

ATPCO



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You'll need a C, C++ and UNIX test background.

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SR. PROGRAMMER/ANALYSTS - RDBMS (INFORMIX or SYBASE in UNIX) •JCL •COBOL •IBM UTILITIES •IMS •VSAM •CICS •DB2

TECHNICAL SYSTEMS ANALYSTS - GUI •RDBMS (ORACLE or SYBASE) •PC PROGRAMMING (preferably VISUAL BASIC) •COBOL •DB2 •VSAM •CICS •JCL •SQL •UNIX or AIX •LAN experience

SR. SOFTWARE PROGRAMMERS - Windows 3.1/Windows 95/Windows NT, TCP/IP, NFS, UNIX and SNA software as well as databases for Windows and Office Suite software. INFORMIX and FORGEN are plusses.

MARKETING INFORMATION SYSTEMS ANALYSTS - COBOL, Easytrieve, FOCUS and/or similar program knowledge, PC tools, Mainframe software TSO/ISPF, e-mail and JCL. Must be able to explain technical processes in non-technical people. Support business objectives for multiple departments. BS degree required.

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The successful candidate should have a minimum of 5 years experience in technical analysis and architecture design across a broad range of business applications with an emphasis in finance and administrative systems. Candidates should possess experience in contemporary technologies including relational databases (ORACLE), client/server, advanced telecommunications and decision support. Candidates should have an established track record of providing strategic technology direction for complex business solution deployment.

This position requires a Bachelor's degree.

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Call our Recruitment Department at 800-860-3377 or forward your resume to **M.I.S. International, Inc., 445 Enterprise Court, Bloomfield Hills, MI 48302; Fax: 810-253-9506; E-Mail: admin02@misint.com.** E.O.E.

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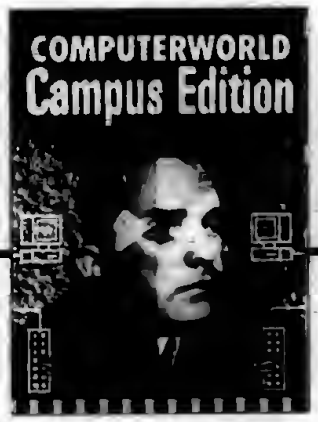

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PROGRAMMER ANALYSTS

The qualified candidates will possess 2-3 years experience developing software in a NextStep development environment and experience with Objective C.

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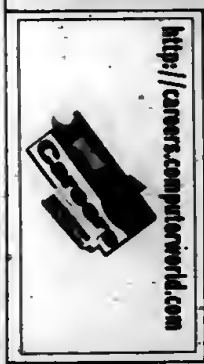

Software Engineer Design, development, maintenance and implementation of commercial applications such as Order Processing, Quotation Preparation, Inventory Control and Oracle Financial Package on platforms such as Oracle, Sybase, and Powerbuilder. Required: B.S. degree with Computer Sci. or Computer Eng. as major and 2 years exp. in the job offered working with Oracle 6/7 and software development tools such as SQL Forms 2.3/3.0, Pro'c, PL/SQL, SQL'Loader, APT-Edit, OWB, APT-SQL, T-SQL, Powerbuilder 2/3, and DEC-5100 and SUN computer $46,000/yr; 40 hrs week; 9a.m. to 5p.m. Two copies of resume to: T. Barfiel, File 960154, DWE-ALC; P.O. Box 7972; Madison, WI 53707-7972. Reference file 960154.

PROGRAMMER/analyst (Consultant) Design & develop custom applications software (financial systems & other operational support systems) according to clients' functional reqs. using employer's relational database s/w & 4GL app dev tools. Develop integration & acceptance test plans, specify reqs. & transform reqs. into detailed designs. Implement systems on a variety of operating systems & networks. Must have BSCS & min. 18 mos. exp. dev rel. d/b bus. systems & coursework (3 quarter or semester hours) or 1 yr exp. in op. sys. internals, networks (incl. client/server arch.), rel. d/b internals, & fin. apps. s/w $4167/mo. Job/interview Irving, TX. Apply at the Texas Workforce Commission, Dallas, Texas, or send resume to the Texas Workforce Commission, 1117 Trinity, Room 424T, Austin, Texas 78701. JO# TX7856076 Ad Paid by an Equal Opportunity Employer

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PROGRAMMER/ANALYST Analyze computer systems. Design system specifications. Develop multi-language computer code in the Pascal/Basic/Sybase/Informix/Unifacs/C/C++ application languages. Test and maintain systems. Full-time (40 hours per week), 8AM - 5PM. $53,000 per year. MS degree in Computer Science required. Three years' experience as programmer/analyst, computer programmer, analyst, or technical consultant required. Must have proof of legal authority to work permanently in the U.S. SEND 2 COPIES OF BOTH RESUME & COVER LETTER TO: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, Illinois 60605, Attention: BRENDA KELLY. Reference # V-IL 13638-K AN EMPLOYER PAID AD. NO CALLS.

Sr. Systems Analyst to conduct studies pertaining to development of new information systems to meet current & projected needs; study existing information processing systems to evaluate effectiveness & develop new systems to improve production or workflow if required, responsible for projects from interacting with clients for user requirements thru implementation at client site. Use VMS, UNIX, DOS, Windows NT, Oracle, Informix, MVS/VS, SQL* Plus, C++, Visual Basic & SQL* Server. Reqs. Bach. in Comp. Sci., Computer, Electrical or Electronic Engg., Systems Analysis, Comp. Info. Systems, Math or equiv., 2 yrs exp in job offered or 2 yrs related exp such as Systems Analyst or Programmer Analyst. Related exp must include systems analysis, systems study using object oriented technology, design & implementation of systems using VC++, Visual Basic, C & COBOL on VME, UNIX, Windows & DOS platforms & RDB, Oracle, Ingres & Informix databases. $42,640/yr. 40 hrs/wk 9a-5p. Send resume or 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref. #101596 "Employer Paid Ad"

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Candidates should possess a BS in CS, MIS or related discipline with entry level to 2 years of experience. Seeking consulting, analysis, design, construction, implementation and support experience with applications software. Knowledge of a combination of the following also required:

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- **Tandem Applications Programmers**
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MVS Opportunities

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We are a leading international software vendor offering comprehensive solutions for large MVS data centers. BETA Systems Software, Inc. is currently expanding North American operations at our corporate headquarters in Atlanta. Our rapid growth has us looking for immediate applicants for the following positions:

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A strong Systems Programmer and/or Operations/Production background with strong communication skills

Customer/Pre-Sales Consultant
Experienced Production Control or Operations Leaders. Customer oriented individuals, with strong communications and presentation skills

Sales Executive
Successful sales professionals with knowledge of the MVS market

Technical Writer
Must have strong communication skills and experience in documenting software products or applications

UNIX Developers
Familiar with writing systems management applications and operating system interfaces.

MVS Developers
Experienced systems level Assembler and/or C programming

Galaxy Developers
Experienced in C and C++ development using Galaxy Environment

Mail or Fax your Resume & Salary Requirements to:
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Human Resources
3490 Piedmont Road, Suite 1100 Atlanta, GA 30305
Tel.: (800) 777-9864 Fax: (404) 812-1556

DateBase Design Analyst. Analyze user require & coord discovery sessions with users. Design logical & physical databases & coordin database develop as part of project team applying knowledge of database design stand's & data base mgmt sys. Analyze exist user sys & data sources & design the most appro & efficient meth ods for access /storing data. With users determine scope limits & cost of proj & produce proj spec's. Produce data model(s) & set standards for data dictionary, data accessment. Develop user interface to data w/user & other team members. Must have exper in design testing & implement computer sys. involving large (GT 200 Mb) relational databases. exper in client/server environ & exper w/ data models/database access tools & design relational database structures. Must have strong cust -relations-building & proj mgmt orient. Must have knowl of multip relational databases, CASE tools. Must be willing to relocate within U S on project-by-project basis. Required computer applic's Cobol programming ASSEMBLER Datamanager BJWI Oracle Oracle PL/SQL, Adabas Concepts & Facilities Natural Natural 2 Natural Construct applic develop SCO UNIX SYSADM SHELL UNIX Oracle Applic Tuning V6 Oracle Database Admin V6 Oracle SQL Forms V3 C Programm Control Mgr ORACLE Case, Oracle RDBMS C++ exposure to multiple RDBMS Must have knowledge of multiple programm lang's & oper sys & able to adapt easily from one medium to another Must have Bach's Degree or equiv in Computer Sci or related and 3 years work exper & 4 mos training in Cobol Programming Hrs 9a-5p M F $55 000 per year Apply to Georgia Dept. of Labor Job Order #GA 6017034, 2943 N. Druid Hills Rd Atlanta GA 30329-3909 or nearest Dept of Labor Field Service Office

UNIX Systems Administrator

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Wyeth-Ayerst Research, a major division of Fortune 140 American Home Products Corporation has an opportunity available in the R&D Computer Services department of its Pearl River, New York pharmaceutical research facility.

The selected candidate will be responsible for system administration and support of UNIX Servers, including system monitoring and tuning, software installations, data storage and recovery, and disaster recovery planning, providing problem resolution and user support for all UNIX related issues, working closely with the R&D Computer Services staff and other research locations to plan and implement UNIX strategies across sites, providing back-up support for VAX system administration, provide network planning and implementation coordination for network support and enhancements.

Requirements include a Bachelor's Degree in Computer Science or related field with a minimum of 7 years of related experience, including experience managing UNIX servers. Knowledge of Open VMS, VAX systems, and computer networking, as well as experience supporting a networked computer environment is desired.

Wyeth-Ayerst offers an excellent compensation and benefits package in a highly professional environment. Please send your resume with salary requirements to: **Wyeth-Ayerst Research, Human Resources Dept., Position #OP-1901, P.O. Box 7886, Philadelphia, PA 19101-7886, or fax your resume (in fine mode if possible) directly into our centralized Research resume database at (610) 989-4854. e-mail: jobs@RAMAIL1.wyeth.com (ASCII format, no attachments, subject: resume).** Principals Only. Equal Opportunity Employer. M/F/D/V.

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Desirable skills for Programmers and Analysts include the following:

- IMS DB/DC
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- CICS
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- FOXPRO
- PEOPLESOFT
- PARADOX
- UNIX ADMIN
- ADABAS/NATURAL
- ORACLE
- ASSEMBLER
- SAP

SCB is a publicly traded company listed on the Nasdaq Stock Market. The Company offers employees competitive salaries and benefits including stock options and incentive-based awards; leadership opportunities through a decentralized management structure and unique career path opportunities resulting from being a rapidly growing company. Learn more about SCB at http://www.scb.com

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Attn: Debbie Perdzock
1375 West Brierbrook Road
Memphis, Tennessee 38138
FAX: 901-759-4836
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SENIOR ITS SYSTEM ADMINISTRATOR

BASIC FUNCTIONS:
Under the general direction of the Chief of the Intelligent Transportation System (ITS), has responsibility for maintaining, monitoring and updating data related to MARTA's ITS System and subsystems. Ensures all data related to bus routes, stops and schedules is correctly maintained in the system and properly displayed in the bus system graphic information system (GIS). Performs user system administration tasks for a variety of information systems including Itinerary Planning (PARIS), Computer Aided Dispatch (SMART TRACK), and Ridership Performance Information System (RPMIS).

Maintains and trouble shoots ITS and SMIS systems and hardware problems. Generates reports and retrieves data for management use. Establishes system backup procedures and coordinates the installation of contractor supplied software upgrades. Develops ITS performance/productivity reports and assist Information Systems in testing and analyzing modifications. Serves as liaison in the communication and exchange of data with Georgia Departments of Transportation's Advanced Transportation System (ATMS).

Performs other related duties as assigned.

QUALIFICATIONS:
Bachelors Degree in Management, Computer Science or related field required. Four years experience managing, updating and maintaining integrated databases. Experience to determining user information needs and designing reports using report generating software. Experience with UNIX systems desired. Experience with Oracle and Sybase database management systems and report generators highly desirable. Must be knowledgeable for graphic information systems (GIS) applications and administration.

Please send resumes to: MARTA
2424 PIEDMONT ROAD, N.E.
ATLANTA, GEORGIA 30324
ATT: Willie Rice
404-848-5380 fax

SYSTEMS ENGINEER to render CAD design services: configuration, installation and training for AutoCAD and CAD programming; integration of CAD data exchange solutions into existing system. CAD database management and CAD database diagnostic tools and use of IBM and HP plotters, digitizers, scanners and field surveying equipment, development of data exchange integration tools utilities and programming for retrieval or exchange of CAD data; develop training programs and materials for CAD applications and optimization of CAD data information flow; planning, procurement and installation of MS-DOS based engineering design and drafting packages for customers individual systems, and test, analyses and design of mathematical data of the CAD models for civil engineering and architectural applications. Require B.S. in Civil or Computer Engineering with four years experience in the job offered. Salary: $48,000 per year, 8:30 am to 5 pm, M-F. Apply by resume in duplicate to: Georgia Department of Labor, Job Order # GA 6017977, 465 Big Shanty Road, Marietta, GA 30066-3303 or the nearest Department of Labor Field Service Office.

KCS.

KCS Computer Services is a premiere system integration, training, and custom software development organization. KCS is seeking Systems and Data Architects, Analysts, Programmers, and Communications Experts in Mainframe and Client/Server environments. In addition, KCS seeks industry experts in Banking, Healthcare, Manufacturing, and technical experts in Multimedia and MicroSoft. The following are typical skills required:

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- **VISUAL BASIC/VISUAL C++ POWERBUILDER/C++**
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- **COBOL/CICS/NATURAL**
- **IMS/DB2**

KCS also has an additional office in Cleveland.

KCS Computer Services, Inc., 777 Penn Center Blvd., Suite 600, Attn: CW9, Pittsburgh, PA 15235-5906

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fax (412) 823-8821
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Network Systems Engineers • System Engineering • LAN/WAN Design • Network Security/Management • Telephony • ATM • Frame Relay • ISDN • SS7 • SDH/PDH

Network System Administrators • AS Degree (preferred) • Windows NT • UNIX • Help Desk Support

Program Managers & Systems Engineers/Information Technology • SW/System/Network Analysis, Design & Integration • IS Reengineering • Imagery • Workflow • Windows 95 & NT • C/C++

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Full-time Computer Support Specialist responsible for generating automated test scripts for client functionality using 4dos/tetack, scripting language, Bourne shell scripts and expect. Translate 4dos scripts to new scripting language. Duplicate bugs and generate test scripts, identify program, script, or configuration file to identify and remove bug from all platforms. Responsible for installing, updating, and removing software for DOS/Windows and device drivers for Unix OS's. Rebuild kernels, modify system configuration and customer systems for testing/installation. Responsible for lab maintenance including ensuring networking interfaces are accessible, as well as ensuring the proper functioning of equipment; inventory control. Must have a Bachelor's degree in Computer Science. Must have educational or work background with object-oriented languages, C, C++, DOS, Windows, UNIX, data structures, databases, system analysis and design, computer architecture and system configuration, and technical writing. Must be bilingual in Spanish and English to provide technical support, translate screen menus, prompts and help screens, technical support documentation and end-user manuals. Salary $30,000/yr. Send resume to CW-180769, Computerworld, Box 9171, Framingham, MA 01701-9171 or fax to 508-820-7739 referencing CW-180769.

SAP CONSULTANT (APPLICATION SYSTEMS ANALYST SENIOR) - Atlanta, GA; Utilizing business knowledge of the Production Industry instruct & mentor lower level systems analysts in the use of configured systems; Analyze & document customer requirements for implementation & integration of SAP (Systems Applications & Products in Data Processing) modular computer software system, utilizing exp. w/human resources software. Propose solutions to Lead Level Systems Analysts. Analyze & propose use of SAP in business solutions directly to the client. Configure tables to ensure proper transactional functionality & integration w/other modules. Bachelors Degree in Comp. Science, Engineering, Mathematics or Info. Technology required. Must have 1 year exp. in job offered or 1 yr exp. as SAP Consultant or Analyst. 1 yr related exp. must incl. SAP human resources software in the Production industry. $60,000/yr, 40 hrs/wk, 9:00 - 5:00. Must be willing to relocate to work sites w/in the Southeast region. Must have proof of legal authority to work in the U.S. This is an employer paid ad. Apply in person or send 2 resumes/ltr and enclosed ad to: Georgia Department of Labor, Job Order # GA 6012428, 2943 N. Druid Hills Road, Atlanta, GA 30329-3909 or the nearest Georgia Department of Labor Field Service Office for referral to employer.

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By [illegible] for value, personal attention and [illegible] services, we've become [illegible] system for total quality care. In short, we [illegible] power to be everything our community [illegible] us to be—and more. Join us, and help us [illegible] the way to a better tomorrow.

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This individual will assist us in converting our mainframe applications to client/server, as well as developing new applications for the airline industry. To be considered for this position, an applicant should have the following qualifications:

- 3-5 years C++ experience
- Proven background as a T[illegible]
- Has participated in the [illegible] and practices for a distributed computing environment
- GUI Design experience
- OO Lifecycle Development [illegible]

PROGRAMMER ANALYST

Initially, these individuals will [illegible] and enhance our existing MVS applications. [illegible] this is an excellent opportunity to migrate your career to the client/server environment. To be considered for this position, an applicant should have 2+ years experience in the following:

- COBOL or C++ or ADS-O
- DB2 or IDMS
- CICS or IDMS
- MVS JCL

ATPCO

CHIEF COMPUTER PROGRAMMER. Analyze sys spec's., create program designs, plan, sched & assist in author of programs for new computer sys. or enhancements to exist. sys. Consult with sys. analysts to ident and isolate possible implement. problems & inconsistencies in spec's. Identify automated processes & sys. interfaces, such as batch jobs & GUI (Graphical User interfaces). Define sys. architect. & create sys. design doc's. containing detailed programm spec's. for individ. sys. modules. Prep time estimates. Sched & assign prog. units to programmers. Design physical database from data model using CASE tools. Prep. stand's. for programm. & naming conventions. Create & maintain development environment. Train subordin's. in programm techniques & methodologies. Create programmer & user manuals as document. for the sys. Coord sys. implement & support. Must be willing to relocate within the U.S. on project-by-project basis. Required computer applic's.: Systems Analysis & Design (structured methods), Database Analysis & Design using structured methods, GUI Design, Programming, User Training, Database Administrator (DBA). Manufact., inven mgmt. & finan. sys. Program Languages: Progress v.8, 7 & CA-Clipper, Ingres & C. Databases: Progress v.6, 7 & 8. Database install. & admin. on DOS, Windows, NLM, UNIX, & AS/400. Ingres. Oper Sys.: DOS & Windows 3.1/95, UNIX & OS/400. Networks: Novell Netware and TCP/IP. Must have Bach. Degree or equiv. in Info. Science or related, & 8 years' work exper. Hrs: 9a-5p, M-F. $58,400 per yr. Apply to Georgia Dept. of Labor, Job Order #GA 6015015, 2943 N. Druid Hills Rd., Atlanta, GA 30329-3909 or nearest Dept. of Labor Field Service Office.

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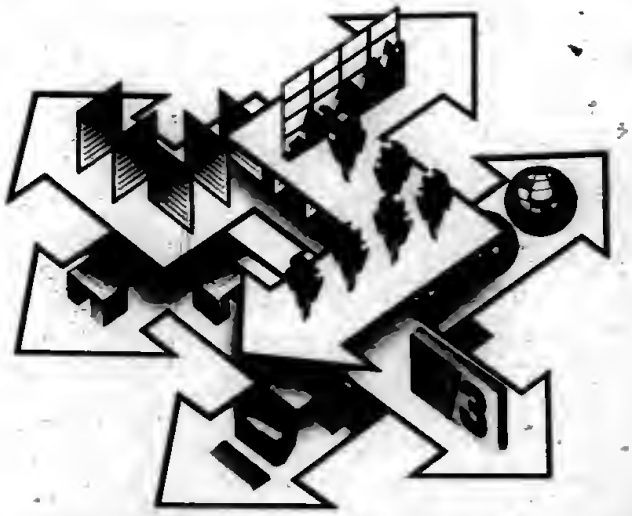

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SOFTWARE ENGINEER: (2 positions) 40 hrs./wk., 8am-5pm, $47,000/yr Carry out the design, development, testing and implementation of s/w application systems utilizing VMS, Rdb, TCP/IP, COBOL, C, X-Windows and MOTIF. Reqr Bachelor's degree in Computer Science or Electrical or Mechanical Engrng. or equivalent* and 2 yrs. expr in job offered or 2 yrs. expr in Systems Analysis &/or S/W Engineering &/or Programming &/or Computer Consulting. (*Will accept 6 yrs. expr in job offered or 6 yrs. expr in related occupation in lieu of Bachelor's degree and 2 yrs. expr in job offered or related occupation.) Require work expr in developing s/w systems utilizing VMS, Rdb, TCP/IP, COBOL, C, X-Windows and MOTIF. Employer is S/W development/consulting firm. Relocation to various client sites throughout the U.S. for periods of 6 mos. to 2 yrs. required. "Employer paid ad" E.O.E. Send resumes to 7310 Woodward Ave., Rm. 415, Detroit MI 48202. Ref #100696

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Systems/Database Design Analyst, 40 hrs/wk, 9am-5pm, $42,000/yr. Analysis, design, development & implementation of software applications using hierarchical & relational database systems, 4GLs & GUIs. Database administration. Client/server technology on multi-hardware, multi-software platforms. Tools: UNIX, Uniface, Motif, Macintosh, MS-Windows, ORACLE, CASE tools, C, Integra SQL, ESQL, Objectrave, ODBC, SQL Forms, SQL Reportwriter, Pro*C. M.S. in Computer Science or Computer Information Systems as well as 1 year exp. in job offered or as Software Engineer required. Previous exp. must include UNIX, UNIFY, C, Integra-SQL, ESQL, Informix, Inscribe, Objectrave, ODBC, ORACLE & related tools. Must be willing to travel on assignment. Must have proof of legal authority to work permanently in the U.S. Send two copies of both resume and cover letter to ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street, 3 South, Chicago, IL 60605. Attention: Leila Jackson, Reference #V-IL-14843-J. NO CALLS. An Employer Paid Ad

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Programmer/Analyst - client sites in metro Chicago, IL & Co loc in Lisle, IL. Analyze, design, devel., implement & maint. three tier system using object-oriented technology & Rumbaugh methodology. Utilize C++, Tuxedo 5.0, System Architect 3.0, PowerBuilder & Oracle 7.0. Bach./Comp Sci or Engg or Math 2yrs/exp in job offered or 2yrs as Prog &/or Grad Asst &/or Rsrch Asst &/or Cust. Svc Engnr. Exp. in job offered or related occ must incl 1yr using object-oriented technology & Rumbaugh methodology, C++, Tuxedo 5.0, System Architect 3.0, PowerBuilder & Oracle 7.0. 40hrs/wk (8-5 M-F) $42,000/yr. Must have proof of legal authority to work permanently in the U.S. Send 2 copies of both resume & cover letter to Illinois Dept. of Employment Security, 401 South State St., 3 South, Chicago, IL 60605. Attn: Janet Aschenbrenner. Ref # V-IL 15720-A. AN EMPLOYER PAID AD NO CALLS

SOFTWARE ENGINEER (2 positions) 40 hrs./wk., 8am-5pm, $52,000/yr. Carry out the design and development of application systems, prepare external and internal design specifications, develop programs, test scenarios, test cases and assist in implementation utilizing IDMS, COBOL, C and ORACLE. Require Bachelor's degree in Computer or Electrical or Mechanical Engrng. and 3 yrs. expr in job offered or 3 yrs. expr in Systems Analysis &/or S/W Engineering &/or Programming &/or Computer Consulting. Require work expr in development of applications & with IDMS, COBOL, C and ORACLE. Employer is S/W development/consulting firm. Relocation to client sites throughout the United States for periods of 6 mos. to 2 yrs. required. "Employer paid ad" E.O.E. Send resumes to 7310 Woodward Ave., Rm 415, Detroit, MI 48202. Ref #99296

SUPPORT PROGRAMMER ANALYST (2 positions) 40 hrs./wk., 8am-5pm, $37,200/yr. Interact with client to study the requirements to develop/modify (On-line/Batch) programs on IBM AS/400. Write design documents, code, test and implement application system using OS/400, RPG/400, CL/400 and ADT. Prepare documentation, conduct system administration and user training. Require High School Diploma and 2 yrs. experience in Systems Analysis &/or Programming &/or Consulting &/or Training Assistant/Coordinator. Require work experience with [illegible] AS/400, RPG/400, CL/400 and ADT. Employer is S/W development/consulting firm. Relocation to client sites throughout the U.S. for periods of 6 mos. to 2 yrs. required. "Employer paid ad" E.O.E. Send resumes to 7310 Woodward Ave., Rm 415, Detroit, MI 48202. Ref #105296

ANALYST/PROGRAMMER - as member of team & using AS/400 analyze, design, program, integrate, test & maintain batch & on-line systems. BA/BS degree or Equivalent, major in Comp. Sci. or Math or any related field w/ 2 yrs. exp in job offered (to include 1 yr in use of AS/400). In lieu of BS degree & 2 yrs. exp. will accept 4 yrs. full-time exp in job offered. 40 hrs/wk, $36,000/yr. Send res to Job Service of Florida, 1001 Executive Center Dr., Orlando, FL 32803-3520. Re JO# FL-1478488

Consultant, 40 hrs/wk, 9am-5pm, $38,000/yr. Design, develop, implement & test software using client/server & object-oriented techniques. Graphical user interface (GUI) development. Tools: UNIX, X/Windows, C, C++, SQL, MS Windows, Visual Basic, HTML, TCP/IP. M.S. in Computer Science* as well as 1 yr experience in job offered or as Graduate Assistant required. (*M.S. degree in any engineering field with 1 yr experience in software development also acceptable.) Previous experience must include GUI development, C, C++, UNIX, Visual Basic. Send resume to Job Service of Florida, 2312 Gulf-to-Bay Blvd., P.O. Box C, Clearwater, FL 34618-4090. RE: Job order #FL-1481859

SOFTWARE ENGINEER. Responsible for software design, analysis, & implementation. Functions as project engineer of small projects. Write, code, test & debug software on both MS-DOS & MS Windows using Visual C++, C & C++. Troubleshoot/resolve product problems. Requires BS in Computer Science or related field, 3 yrs exp in job offered & familiarity with Simple Network Management Protocol, Management Information Base & Microsoft Foundation Class. SALARY: $45,153/yr. JOB SITE: Carson City, NV. 40 hr wk. 8a-5p. Submit resume & copy of ad to #9625851, Nevada Employment Security Div., 70 W Taylor St., Reno, NV 89509-1700

SENIOR PROGRAMMER ANALYST to analyze, design, develop, implement and maintain applications and provide technical support. Utilize DB2, CICS, EXPEDITOR, VISUAL BASIC and JCL. Applicants must have bachelor's degree in Computer Science, Engineering or Math. Two years experience as Software Engineer and/or Systems Analyst. Experience must include one year using DB2, CICS, EXPEDITOR, VISUAL BASIC and JCL. 40 hrs./wk. (8-5, M-F) $45,000/yr. Please send two resumes to Case # 60913, P.O. Box # 8968, Boston, MA 02114

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Project Manager (Framingham, MA) Consult w/clients to identify & define their rqmts for interfaces, data conversion of customized enhancemts to standard SAP (Systems Appls & Products in Data Processg) accountg & logistics mgmt appls incl. forecastg, productn & distributn planng & control, inventory mgmt, product cost accountg, integratn of Planng & Sales modules; Manage teams assigned by clients to design, code, revise & rewrite systems & funct'l specificatns; Engage in the funct'l analysis of client bus. & mgmt operatns to determine the SAP appls. best suited to their particular uses & determing the appls. best suited for customized design & implementatn. Develop systems testg methodology; Coordinate project systems testg. Train client's info systems personnel in the use of their customized SAP appls. Configure & test systems in order to match the bus. rqmts of our clients; Manage the adaptatn, design & developmt of SAP proprietary products accordg to their systems needs & end-user rqmts; & Plan projects, incl the preparatn of estimates of required analytical & programmg tasks. Bachelor's or equivalent in Comp Sci, or Engineering + 5-yr exp in job offered or 5-yr as Project Leader/Systems Analyst. All prev exp to incl extensive exp w/SAP design, developmt & implementatn. May also req short/long term relocatn at co. expense to various client sites throughout US to meet contractual obligatns. 40 hrs/wk. OT as needed. 9-5. $150K/yr. Send resumes & letters in dupl to: Attn Case # 60958, PO Box #9868, Boston, MA 02114.

Programmer/Analyst desired by Oklahoma company engaged in computer systems development & sales. Responsible for computer communications systems software design & development of large systems that use interprocess communication operating in PC/DOS & Windows; conceptualize & design integrated systems including user interface & database access requirements; integrate developed codes (C & C++) with proprietary products; develop systems providing for cross-platform operation of systems, communications between Windows programs (Interprocess Communication), compression agents (Dynazip) & integration of Windows Print Manager functionality; debug programs already in production; train Help Desk personnel in use of programs; provide technical assistance concerning system use & operation. Require Bachelor's in Computer Science or equivalent AND 2 years experience in job offered OR software and systems development. Will accept degree in Engineering or Physics with 1 additional year of experience. Experience must include work with "C++" codes and UNIX. All experience may be gained concurrently. Must have proof of legal authorization to work in the U.S. EOE. Salary $31,000, 40 hr week, 9:00 a.m. to 5:30 p.m. Send resume to Job Order #235307 Oklahoma State Employment Service (#7400), 501 E. 5th St., Bartlesville OK 74003.

Sr Component Design Engineer Cntrl logic design thrgh hi-speed CMOS data pths, while meeting reqd specs (frequncy, pwr & area); design & simulatn of DRAM & SRAM CMOS memry crcuits to ensure thl product meets specs, design custm crcuits & crcuit tmng anlysis of same, for hi-frequncy opratn; prfrm crcuit implmentatn & layout; dvelp CAD tools using C lnguage, VLSI design with sneitivty to die size & hi-frequency opratn. Cndct object-orntd prgrmmng; anlyze prsnt & future-genratn cmptr architecture, using pipeline & supscalr architecture methods, to ensure that it meets & exceeds today's standrds. Ph.D. in Elec Eng or M.S. in Elec Eng plus 2 yrs exp in job offrd or in cmponnt design eng reqd. Grad crsework, grad rsrch or emp exp must hve prvsly hnds-on bckgrd in advancd CMOS VLSI design, pwr & supscalr arhctre mthods; analog & dgtl crcuit design; semicndctr device physics & CMOS tech. prgrmmng in C in a UNIX environmnt. Min 40/wk. $6,100/mo. job site & intrvw: Santa Clara, California. Qual applcnts send res to: AD&KM86034FC, PO Bx 58119, M/S SC4-117, Sta Clara, CA 95052-8119. Prf of auth to wrk in US req'd hrnd. The company is an Equal Opportunity Employer and fully supports affirmative action practices.

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At CTG, we've recently made two important lists.

1. Computerworld's 100 Best Places to Work

CTG's inclusion in Computerworld's 100 Best Places to Work is testament to our commitment to our people. In addition to a progressive, flexible benefits plan, CTG consultants have the option of working with us on an hourly or salaried basis. And with the majority of the Fortune 100 among our clients, we can offer more opportunities for professional development and advancement.

2. CTG's Most Recent Opportunities

With 50 offices throughout North America, CTG offers a wide range of opportunities for a wide range of skills. Current openings include:

Baltimore, MD
- COBOL, CICS, DB2
- ORACLE Financials
- COBOL, IMS

Central PA
- COBOL, IMS, DB2, CICS
- ORACLE, C++
- Lotus Notes

Greenville, SC
- IDMS/ADSO
- DB2, CICS, COBOL
- IMS DB/DC
- VAX Systems Manager

Charlotte, NC
- IMS DB/DC
- COBOL/DB2
- COBOL, CICS, DB2
- APS with banking exp.
- Data Modeler/Data Warehousing
- Data Analyst/Business Analyst
- Visual Basic
- ORACLE DBA and Developer 2000

Washington, DC
- C/UNIX
- ORACLE/SYBASE
- Testers
- Integrators
- Developers
- Software Engineers
- Telecommunications

Raleigh, NC
- VAX/VMS
- Fortran
- COBOL, CICS, DB2
- Visual Basic
- FORTE
- C, C++, Visual C++
- Assembler
- Gupta SQL
- PowerBuilder
- MVS

Winston-Salem, NC
- COBOL, CICS, DB2
- AS400/RPG400
- Software Testing
- Database Analysts
- C/C++, PowerBuilder
- Visual Basic, Access

Delaware Valley PA
- COBOL, CICS
- PowerBuilder, ORACLE
- Tandem
- C/UNIX
- Peoplesoft

If you're ready to join a company known for its commitment to its people, put CTG on your short list. For consideration, send your resume, indicating geographic preference to: **CTG · Mid-Atlantic Sourcing Center, 5540 Centerview Drive, Suite 200, Raleigh, NC 27606-3379. Phone: 800-951-6577, ext. 125. Fax: 800-847-9962.** Equal Opportunity Employer M/F/D/V

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Our Information Systems department is a strategic corporate resource that drives our ability as a company to consistently expand while improving customer service. We provide tremendous opportunity for Information Systems professionals at all levels that are seeking stable career opportunities in a high energy, challenging environment.

Best Places to Work 96

All positions are located in our corporate offices in Bentonville, Arkansas, near the beautiful *Ozark Mountains, Beaver Lake,* and the *University of Arkansas.* In Northwest Arkansas you will discover a lifestyle that combines urban amenities, easy commuting, and a progressive atmosphere while retaining the flavor of small town living. Arkansas is a wonderful place to raise a family, and we ought to know: **WAL★MART**'s corporate family is one of the biggest and best in the nation.

Your opportunity to work in a dynamic, award-winning Information Systems Division awaits you. Both entry level and experienced professionals are encouraged to apply for positions using IBM mainframe, UNIX, PC workstation development, networking, or telecommunications. Business experience in Grocery, Merchandising, Distribution, Real-Estate, Pharmacy or Optical is a plus.

Come and join the people that make a difference. We offer competitive salaries and benefits. If you are willing to begin a dynamic career with **WAL★MART**, please mail, fax or e-mail your resume to:

WAL★MART

WAL★MART Information Systems Division
Attention: Recruiting, Dept. 8U8050UCW
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Bentonville, AR 72716-8050
Phone: (501) 277-3901 Fax:(501) 273-
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A commitment to excellence in customer service. . .the ability to interface effectively with all levels of personnel. . .superior issues resolution. . .a renewed commitment to a structured methodology. If you share these professional goals and philosophies, then we invite you to consider joining our Technology Services Team today.

INTEGON CORPORATION, located in Winston-Salem, North Carolina, is a multi-million dollar Property and Casualty insurance company whose success and enviable expense ratio is a direct result of our continued focus on utilizing innovative technology in all facets of operation. We are committed to recruiting and retaining the highest quality of Information Systems professionals. Therefore, if you are seeking an opportunity as a business partner within a dynamic, growth-oriented organization, we invite you to consider the following employment opportunities.

MAINFRAME PROFESSIONALS

Candidates who possess a strong background in COBOL, CICS and/or Focus will be considered for this area. Additional experience in PMS (Series II or Series III) as well as developing and supporting financial systems is helpful.

PC PROFESSIONALS

C/C++ and Visual BASIC experience in a DOS and Windows environment is required for consideration. In addition, Access, Client Server and Relational Database experience is strongly preferred.

All positions require a Bachelor's degree in an appropriate discipline (MBA or advanced training preferred) and a minimum of 5-10 years of related employment experience.

- Additional position for ORACLE SA/DBA. 2-4 years experience required. Seeking candidate preferably with version 7.X knowledge.

Our location in Winston-Salem offers a wealth of educational, cultural and recreational opportunities. Situated east of the Great Smoky and Blue Ridge Mountains and west of the Carolinas' crystal coast, our area offers 4 distinct seasons for your recreational and living pleasure. In addition to our location, Integon offers a comprehensive benefits package to include: major medical coverage, dental and vision care programs; continuing education assistance; on-site child care center; corporate wellness program; and relocation assistance (if applicable). For prompt consideration, a current resume and cover letter, including salary history/requirements may be submitted to: **Integon Corporation, Human Resources Representative, CAIS-LA3, P. O. Box 3199, Winston-Salem, NC 27152-3199, Fax: (910) 770-2190. Internet: humanresources@integon.com**

All applicants who are offered employment will be required to successfully complete a drug screening test. EOE

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CONSULTANTS

IMMEDIATE INTERVIEWS

MAINFRAME

DB2/CICS	• Mod • PL1
DBA or DC/D	• Modeler • RAS
Manual 2	• Informix • QMF
AS 400	• Tandem • Rdb/Ingres
ADW or IEF	• CSP • VAX
BAL	• MPS • IDMS/ADSO
EDI	• Focus • SAP

CLIENT SERVER

Lotus Notes	• DBA's • C or C++
Sys/Admin	• Novell • Operations
Sybase	• Unix • MicroFocus
Oracle	• Unix • Vis Basic
Lan/Wan	• Sybase • Testers
Tech Support	• Visual C++ • HTML/Java
Informix	• TCP/IP • ODA/ODS
Powerbuilder	• Help Desk • Windows
Win NT or 95	• SAP • Peoplesoft

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Fax 800-770-0880
or Ft. Lauderdale
1451 W Cypress Creek Rd
Creek Center, Suite 300
Ft Lauderdale, FL 33309
954-495-2700 Fax 954-489-8404

Software Engineers / Career Alert

Send resumes as ASCII text to:
resumes@ciws.esid.northgrum.com
or fax (847) 590-3189 or mail resume to:
Manager- Staffing, Northrop Grumman Dept MM/T20, 600 Hicks Road, Rolling Meadows, IL 60008.
For detailed openings, view us through the net:
http://www.cweb.com/resources/northropgrum/
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NORTHROP GRUMMAN

A Better Looking Future Begins with Avon

Avon Products Inc., the world's leading direct seller of beauty and related products is looking for systems professionals for their Information Technology Services Department in Westchester County. Opportunities include:

Telecommunications

We are seeking telecommunications professionals to assist in the implementation and on-going operation of the global corporate telecommunications network (AVONET). The ideal candidates will have 2-7 years experience in a progressive corporate environment, a strong working knowledge of LAN/WAN networking, routing and switching technologies and the ability to monitor and measure effectiveness and proactively respond to service situations.

Experience with Frame Relay, TDM, switched Ethernet, VLAN's and ISDN services is required. We currently utilize IDNX multiplexors, Cisco routers and switches, Bay hubs and the related element management systems. Must have experience with network monitors, RMON and analyzers and test equipment. Experience with PBX's, IVR and voice networks is beneficial.

Systems Development

Sr. Business Analyst/Consultant: Will be responsible for the imaging systems environment hardware/software. The ideal candidate has at least 5 years of experience with "C" and UNIX/AIX. RS/6000 experience a very helpful. Network, communication and NT skills highly desired. Troubleshooting with networking, IBM, C++, UNIX and software debugging skills are required. Mainframe experience in CICS and COBOL is a plus. GUI program development experience is desired.

Sr. Programmer Analyst: This person will provide design and development in the area of Conversant Voice Response Technologies in a UNIX Client/Server environment with an interface to an IBM Host. This position requires experience in cross platform development of Order Entry System from Personal Computer to IBM Mainframes in a LAN/WAN/800 Service environment. Must have solid experience with C/C++ programming in UNIX System V and Microsoft NT. Good knowledge of Oracle SQL, Pro C SQL, Conversant Script Builder plus native code & DIP. TCP/IP code development. IBM Host. Windows, Computer Telephony integration and an appreciation of 800 Services are highly desirable.

Programmer Analyst/Sr. Programmer Analyst: Responsible for the analysis, design and programming and support of the Order Processing and Control systems. This position requires strong VAX/VMS and Alpha experience with Fortran or Basic programming languages. Familiarity with FMS, CDD Vax System Services, DECnet and VAX TCP/IP communications required.

Project Leader: Will direct the design, development and maintenance of multiple application systems consistent with the needs of the assigned client area. Will translate customer requirements into a set of system activities. Must have a minimum of 5 years project leadership experience and managed a staff of 8 - 10 professionals. Must have experience managing projects implemented on Digital VAX platforms. Both domestic and international travel required.

Consultant - Mfg. Systems: Will be responsible for mapping Manufacturing business functions, defining system requirements and building system solutions. Will be involved in selecting a new Manufacturing System as well as supporting the existing legacy environment through transition, ensuring year 2000 compliance, improved system utilization, and integration into the Desktop/LAN environment. Must have strong business analysis skills, including process modeling, system design, client/server architecture, and programming experience in an IBM mainframe environment (COBOL, IMS), knowledge of Desktop technologies and implementation a plus. Experience with AMAPS, QAD MPG/PRO or other MRP, MRPII and ERP systems highly desirable.

Programmer Analyst: Will be responsible for maintaining and modifying existing Sales Application systems. Will write new programs working with basic system designs & specifications, and enhance existing programs. Must have 2-4 years programming experience in any of the following: DOS/VSE, MVS, Cobol, or Cobol II; CICS, DL/1 and DB2.

Sr. Business Analyst: Will assist with the development and design of new inventory accounting & financial applications or new sourcing and logistics applications. The applicant will partner with ITS development, support & technical groups to ensure customer service levels are met and new system development is consistent with AVON standards. Develop project plans and manage tasks to ensure development efforts remain on schedule. Must have 5 to 7 years experience. Must have participated in a major large scale development effort with system design responsibility. Strong systems analysis skills, diversified technical background with DB2, IMS, CICS, MVS, etc.

Avon offers comprehensive benefits and competitive compensation package. If qualified, send resume specifying which position for which you are applying to:

AVON PRODUCTS INC - RYE PLAZA - RYE, NY 10581
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MicroFocus & Y2k	COBOL/RPG Y2k	Informix PA & DBA
COBOL/IMS/DB2	DB2 for AS400	C++, WIN, VB

QUALITECH Systems, Inc.
9250 Baymeadows Road, Jacksonville, Fla. 32256
EOE

Database Administrator
Administer and support applications running on the NOVELL server. Must be able to change configuration settings and set up LAN or WAN as it relates to a TokenRing LAN and Xcellent WAN. Knowledge of Xcellent CMS (Communication Management System) a plus. Should have 3-5 years hands on knowledge of Powerbuilder, Clipper etc., to support company's data resources and ensure data integrity, security, and strong communication skills are needed.

Database P/A
Responsible for installing, configuring, documenting and supporting new and existing databases. Must have 3-5 years of working experience with relational databases such as Watcom, Sybase or Oracle on Novell and Windows NT. Programming in Powerbuilding is a **must**. Working knowledge of project life cycles, testing, and integration a necessity.

EDI Analyst/Coord.
Responsible for developing EDI Standards and introducing EDI technology. Will serve as the primary contact for trading partners and company. Facilitate and make decisions based on information construction and select resources for EDI processing application expansion. Coordinate transmission schedules and map standard data formats. Must have experience interacting with end users, working knowledge of personal computers is a must, some knowledge of IBM AS/400 and/or RPG/400 programming is a plus.

Luxury fashion, footwear and accessory company located in Westchester, NY.

Please mail or fax your resume and salary requirements in confidence.

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SYSTEMS ANALYST — M.S. deg in Computer Sci. plus 2 yrs exper in position or Software Engineer: will design, develop, test, analyze, & modify software & user interfaces using C++/UNIX on SUN, DEC, HP, NT & WIN95 platforms, maintain software & class libraries & perform duties of database administrator & performance tuning. Exper must include 2 yrs in UNIX, C++, TCP/IP, RPC, RAS, TAPI, Windows NT, serial communications programming & PVCS, 18 mos with Raumbaugh & Booch Object Oriented methodologies, X Windows/Motif, Microsoft Visual C++, ORACLE, PRO C, Reportwriter, SQL, SQLFORMS, real-time programming, IPC, CMVC, Clear Case; & 6 mo in Microsoft Foundation Class Libraries & Windows 95. Ref to prove exper. req. Salary: $68,640/yr. Contact Georgia Dept. of Labor, 2943 N Druid Hills Road, Atlanta, GA 30329-3909 or the nearest Dept. of Labor Field Service Office. Ga. Job # 6012149

Software Engineer, Palm Bay, FL: Research, design, develop, test and integrate computer software for Manufacturing applications in NURBS (Non-Uniform Rational B-Splines) -based CAD/CAM system, mainly in 4 and 5-axis tool path development on free surfaces (ruled/free-form/trimmed) and on open or closed B-Rep's. Develop algorithms and code for 5-axis tool placement supporting both semi-automatic and interactive tool path creation. Master in Mechanical Engineering 2 yrs. exp. in job offered or 2 yrs exp. in Multi-axis milling software research and development. Exp. in NURBS, analytic geometry and numerical control software development, multi-axis NC milling operations req'd. 8:30am-5:30pm, 40 hr/wk, $50,000/yr. Mail Resume to Job Service of Florida, 1001 EXECUTIVE CENTER DRIVE, ORLANDO, FL 32803-3520. Re: Job order number FL-1481469.

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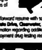
Tech Data Corporation, a Fortune 500 company, is one of the world's fastest growing and most successful distributors of personal computer products. To learn more, please visit our website at http://www.techdata.com. We recently received the honor of being ranked #22 in ComputerWorld's 100 Best Places To Work annual issue.

Tech Data's success can be attributed to our tremendous commitment to technology— it's the driving force behind everything we do. We offer an environment rich in technology— with opportunities existing from operations to directorship-level positions in technologies ranging from client/server to IBM mainframe and LAN/WAN technologies to voice data telecommunications. Current opportunities and technologies include:

OPPORTUNITIES:

Mainframe and Micro Programmer/Analysts and Database Administrators, Business Analysts, Disaster Recovery Analyst, Systems Consultants, Pre-Sales Network Engineers, and Support Technicians.



TECHNOLOGIES:

Visual Basic, Visual C++, MFC, OOD, OLE, Windows NT, SQL, Sybase, DCS, COBOL, CICS, DB2, LAN/WAN, and TCP/IP.

You will enjoy competitive compensation, comprehensive benefits, and living on the Gulf Coast of Florida in the Tampa Bay area. Here, the cost of living is low, the standard of living is exceptional, scenic Gulf beaches are minutes away, and you will receive the added bonus of no state income tax.

Additional opportunities may also be available. Inquiries at all levels are encouraged. Please forward resume with salary requirements to: **TECH DATA CORPORATION, Human Resources, Code JB/JC, 5350 Tech Data Drive, Clearwater, FL 34620; fax (813) 538-7054; e-mail in ASCII or text format to [illegible].** For information regarding additional opportunities, please call our Jobline at (813) 539-7429, dial option 5 then option 1. Pre-employment drug testing required. EOE M/F/D/V

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Tech Data CORPORATION

COMPUTER SOFTWARE SYSTEMS ANALYST Dev sftwr ap. programs per client needs, eval. user reqrmts & existing hrdwr/sftwr. Plan dev process incl flow charts, system specs. & outline steps. Work in INFORMIX 4GL & ESQL/C, PowerBuilder on UNIX, use configuration mgmt & version control tools for release mgmt. Must have BS/Comp. Sci., Engr or Math + 2 yrs exp /this job or sftwr engr incl use of INFORMIX 4GL, UNIX, PowerBuilder & DB tools like SQL or ESQL. Salary $57,000/yr. Jobsite/intrvw Atlanta. Send this ad & resume to Georgia Department of Labor, Job Order # GA 6014325, 2943 N Druid Hills Road, Atlanta, GA 30329-3909 or the nearest Department of Labor Field Service Office.

Engineers, Software (Professional Services Consultant): Responsible for providing technical consultation regarding technical and functional issues regarding implementation, conversion, and customization of HR/Benefits/Payroll, A.P., G/L, and A.R. software processes and functions. Four years experience in job offered to include: software design and development utilizing COBOL, SQL programming, knowledge of Oracle, Informix, or Sybase RDBMS, knowledge of AS400, UNIX and Windows and VAX/VMS environments. $55,000 per year, 40 hrs. per week. Apply in person or send two resumes to: Georgia Department of Labor, Job Order GA 6013611, 2943 N. Druid Hills Road, Atlanta, GA 30329-3909 or the nearest Department of Labor Field Service Office.

SYBASE

SYBASE, Inc. is a key provider of enterprise-to-desktop solutions within seven key verticals, including financial services, insurance, telecommunications, health care, energy, media & publishing and the public sector. With record revenues in 1995 of $957 million, SYBASE is the sixth largest independent software company in the world. According to a recent article in *Computer Business Review*, "analysts agree that SYBASE is in the strongest product cycle in its history." Come take advantage of this opportunity. Do for yourself what we do for our customers: *Solve problems. Gain advantage. Make money.*

SYBASE is actively recruiting technical sales professionals in the following locations: New York, New Jersey, Burlington, Concord, Bethesda, Atlanta, Tampa, Chicago, Dallas, Houston, Philadelphia, Charlotte, Detroit, Minneapolis, Colorado Springs, Denver, Los Angeles, Bay Area, Silicon Valley and Toronto.

MAJOR ACCOUNTS MANAGERS

Responsibilities.

- Manage the total solution sale of the full range of SYBASE products and professional services
- Coordinate the activity of other SYBASE product line sales representatives within existing major accounts
- Manage the use of technical resources during the sales process
- Travel to customer sites in order to assess problems and needs
- Conduct sales presentations

Requirements.

- Five years experience in selling solution software
- Proven track record of over-achievement of quota
- Strong technical background
- Excellent team-building, organizational and presentation skills
- Experience in a particular vertical

SYSTEMS INTEGRATION ACCOUNT MANAGERS

Responsibilities.

- Build a business relationship for SYBASE with Systems Integrators
- Develop new business by creating marketing and sales programs
- Travel to customer sites in order to assess problems and needs by working with the technical resources of the client, SYBASE and the partner
- Supervise the deployment of the SYBASE Certification program for consultants
- Conduct sales presentations

Requirements.

- Proven track record of success working with major Systems Integrators
- Strong technical aptitude
- Excellent team-building, organizational and presentation skills

TELESALES-ACCOUNT EXECUTIVES

Responsibilities.

- Inside sales of SYBASE products and professional services
- Sell through direct and alternate channels to the Commercial and Public sector
- Manage information provided through marketing information systems and programs

Requirements.

- Minimum of 2 years software sales experience
- Knowledge of RDBMS, tools, UNIX and/or NLM products
- A track record of overachievement of quota for at least four years

SYBASE offers an excellent compensation plan as well as a comprehensive, cafeteria-style benefits package. For immediate consideration, please mail or fax your resume to: SYBASE, 6550 Rock Spring Drive, Bethesda, MD 20817, Attn: Cindy Roemer, as send to

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Compaq has targeted Los Angeles, Boston, Chicago, San Francisco, and Houston to be the homes of Compaq's new Enterprise Consulting Services offices. These consulting practices will focus on our critical accounts based to each city in partnership with our existing sales and support partners located there. Permanent full-time employment opportunities are available requiring minimal travel and offering the chance to work with some of the hottest technologies and the brightest minds. We are poised for another leap within the high-tech industry. Are you?

IT CONSULTING MANAGER

In this position, you will provide management and leadership to our field offices by delivering innovative and leading-edge solutions that leverage our products and enterprise computing strategies into Fortune 500 companies. You will manage a highly technical IT Consultant as well as operations (expenses and headcount). Additionally, you will coordinate field activity with respective sales teams, manage client relationships, oversee multiple complex projects, develop business plans, and team with industry leading consultants and systems integrators. The ideal candidate should have an advanced degree in a business/technical-related field, 12+ years of directly related experience, and a proven track record in consulting management, services and high technology. In addition, you should possess a working knowledge of open systems and client server technologies, and you should have excellent communication and negotiation skills. An understanding of the various markets is preferred. Dept. ECS-CW-0826-CM

SENIOR IT CONSULTANT

The successful candidate will provide technical expertise and capabilities that enable clients to gain a measurable competitive advantage through the use of our products and enterprise computing strategies. You will conceive architectural designs for enterprise information systems, support the implementation of large and complex enterprise information solutions, assess IT needs in complex pre-sales technical environments and assist with the sales of professional services to existing and new accounts. We seek a candidate with an advanced degree in a business or technical-related field and a minimum of 12 years' related experience in the delivery of consulting services or in the management of information systems with a Fortune 500 MIS organization. Additionally, you should have a demonstrated technical expertise across the core competencies (OS, LANs/WANs, DBMS, Applications) and a track record that demonstrates successful "ownership" of the design and deployment of large client/server projects. Excellent communications skills and an understanding of enterprise technology to effectively represent our products, capabilities and assets are necessary, knowledge of our products and services is preferred. Dept. ECS-CW-0826-SC

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COMPAQ

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Some of the world's most intelligent, forward-thinking individuals can be found at TRG, Inc. They're at work creating advanced client/server and relational database technology for the higher education marketplace. To develop the next generation of this technology, we're continuing to seek other forms of highly intelligent life.

If you're thoroughly versed in the latest client/server and database developments and you possess a strong entrepreneurial spirit, we have the perfect environment for you. You'll join other top people and work with the most sophisticated development tools in an atmosphere that is absolutely electric. We currently have the following openings:

Software Development Engineers

Requires

- Expertise with Powerbuilder/C++, Sybase or Oracle
- Object oriented methodologies
- SA/BPR tools experience a plus

Systems Analysts

Requires

- BS in Computer Science
- 5 years C/C++ programming
- CASE tools experience
- 2 years Systems analysis in development project
- Knowledge of Powerbuilder or other OO language
- RDBMS and OOAD experience a plus

In return for your contributions, we provide outstanding compensation and benefits as well as the professional autonomy you need to truly innovate. For consideration, submit your resume and salary requirements to: USAGroupTRG, Human Resources, Dept. CW902, 4343 E. Camelback Rd., Phoenix, AZ 85018; fax: 602/808-4001; e-mail: recruitment@mail.trglink.com. Visit our [illegible]trglink.com. EOE

USAGroup TRG™

GartnerGroup

For more than 17 years, Gartner Group has been the world's foremost provider of strategic advice, information and critical analysis on the IT industry. Our strength is the quality of informed, impartial opinion we offer and our ability to speak with authority, assisting major organizations in making IT decisions. Our Research staff are recognized authorities in their sectors, building on impressive backgrounds, enabling us to take knowledgeable positions on decisions that will shape the future of the industry.

As we continue to grow, we are looking for several more IT professionals who have at least 4 years of experience and strong client support skills.

Positions are based in STAMFORD, CT and SAN JOSE, CA. Successful candidates will have experience in such areas as corporate or vendor technical support, systems analysis and programming and network design.

Qualified candidates should send resumes to: **Gartner Group, Attn: NMD/HR, 56 Top Gallant Road, Stamford, CT 06904. Fax: 203-316-6555.**

Principals only. No Phone Calls, Please.

We are an equal opportunity employer. M/F/D/V

INFORMATION TECHNOLOGY RESEARCH ANALYSTS

Gartner Group Research Staff reach their goals primarily by providing telephone consultation and written research.

MIDRANGE SYSTEMS

Distributed servers and operating systems

DATA CENTER

Processors and operating systems

SYSTEMS SOFTWARE AND SYSTEMS MANAGEMENT

Systems management, middleware, transaction processing, information security

NETWORK SYSTEMS MANAGEMENT

In networked, client/server as well as mainframe-oriented environments

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Marketplace

Compaq's Armada 4100 notebook is fleet and versatile

By Howard Millman

PRODUCT REVIEW

Compaq Computer Corp.'s recently released Armada 4100 model line provides a good balance of portability and high-end features. Although not as trim as some of the superslim notebooks from Digital Equipment Corp. and IBM, the Armadas use the extra ounces to deliver a level of scalability ordinarily found only in desktop units.

The built-in MPEG and composite video circuitry, stereo input and output jacks plus 16-bit audio make it especially well-suited for on-the-road presentations. An optional Mobile CD (MCD) Expansion unit contains a six-speed CD-ROM drive plus acoustic suspension stereo speakers. And the Armada's bright 800- by 600-pixel resolution, 11.8-in. active-matrix display offers a sharp, wide-angle image that several people can view simultaneously.

For less-demanding audio endeavors, such as playing Windows' assorted sound effects, the unit's built-in microphone and dual squeaky-sounding speakers (built in to the wrist rest) work satisfactorily.

A convenient if somewhat inelegant handle holds the unit's primary lithium ion battery. The battery case doubles as a carrying handle and a stand to angle the notebook up about 10 degrees for easier typing. Without the handle/battery in place, the unit weighs about 5 pounds. You can add another battery by swapping out the unit's disk drive, which usually mounts in a multipurpose expansion bay. With the battery in the expansion bay, users can link the disk drive to the parallel port with a short cable.

Cross-country test

Each battery provides about three hours of use. Used frugally, the two batteries will power the unit for the duration of a typical cross-country flight. A third battery, mounted in the MCD's battery bay, will bring the total power-up time to about nine hours. With the MCD and a full complement of batteries, the Armada weighs a luggable 9 pounds.

The machine measures 11.5 in. (width) by 9 in. (length). A retractable keyboard, which sinks into the main body as the clamshell top closes, trims the unit's thickness to 1½ in. The nearly full-size keys offer a modest degree of tactile feedback, but there's no free lunch here. The keystrokes lack the solid thunk of a "real" keyboard. On the positive side, the keys' layout follows the familiar layout used in standard keyboards. That minimizes the need to hunt for special function keys.

For owners seeking an all-in-one solution, the Armada's chameleon-like versatility helps transform it into a traveling multimedia machine, a compact desktop or a portable office. For example, when using Compaq's $249 SpeedPaq 288 Telephony Modem, the built-in microphone functions as a speakerphone and pickup around which eight people can gather. The PC Card modem plugs in to one of two Type II PC cards.

The Armada's modular construction lets do-it-yourselfers upgrade the CPU, increase RAM, swap input devices and quickly change hard drives without opening the case. After the first 10 minutes of use, we swapped out the tiny touch pad for the (optional) trackball. We definitely preferred the trackball, and found it easier to control the pointer. Unlike notebooks from IBM, the Armada doesn't offer a pointing-stick mouse control, our all-time favorite.

The MCD, which also adds a game and Musical Instrument Digital Interface input ports, attaches to the unit's base with two thumbscrews (latches would have worked better). Adding the MCD increased the Armada's height to 2.3 in. This arrangement lets you add the extra 3 pounds and 1-in. thickness only when you need it.

Our test unit sported a P/133 CPU, 16M bytes of RAM, a 256K L2 cache, a 28.8K bit/sec. PCMCIA modem, a 1.8G-byte hard drive, a detachable six-speed CD-ROM drive, a trackball and a removable floppy drive. The fully equipped unit costs $5,534, slightly below the average amount that similar units usually cost. ■

Millman operates the Data Systems Services Group, a consultancy in Croton, N.Y.

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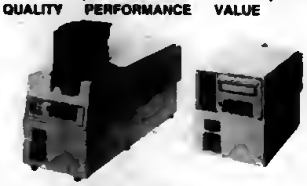

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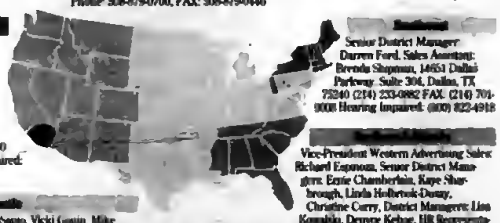

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Abernathy and Johnson spent an hour with *Computerworld* senior editor Tam Harbert explaining the concept and how it might apply to information systems managers.

Q: *What is your firm's mission?*

Abernathy: To bring together the leaders of the technology revolution and enable them to maximize their contribution to society and the financial rewards that the contributions afford them.

There are two things that are extremely important to understand about making investments. Certainly, the information that IS managers have is extremely important, just like the information that doctors have about procedures in the operating room or devices or drugs is important. But where doctors have always gone wrong — [they] have notoriously been the worst investors imaginable — is they don't match that with the financial information from a professional. And that's the link that we provide.

Q: *So you're managing private money for private investors?*

Abernathy: We manage three hedge funds. The partners in the funds are people in the information area and the health care area. And those are the two areas that we invest in. We [manage] a little bit more than $100 million.

Q: *How much of your portfolio is in information technology stocks vs. health care stocks?*

Abernathy: It's probably 60% to 70% in information technology. We categorize health care technology as anything from pharmaceutical research to biotechnology to health care to diagnostic equipment. All those things involve a certain amount of technology.

int venture, y (left) and l emphasize e investing

Lisa Thomas

Q: *Could you explain the concept of "interactive investing" and distinguish how that is different from other investment methods?*

Abernathy: The definition of interactive investing centers on something that a very wise man by the name of Warren Buffett believes in very strongly: Everyone has a circle of competence, and as long as you stay within that circle of competence, you're probably going to be OK. What specialization does is it reduces risk. Interactive investing matches the expertise of industry professionals with the financial acumen of Wall Street. We seek out people that are the experts in the industries and invite them to join our group. We only take people that have expertise in the areas we invest in.

Johnson: Very often our experts are customers of the companies that we are interested in. They don't really have insider information, or if they do, they are under nondisclosure. We are especially interested in how the market perceives products, trends, etc.

Q: *Market research, in a way, is what individual investors are doing in online forums such as "The Motley Fool." How might this online activity be related to your concept of interactive investing?*

Johnson: Online stuff is an additional information source, but I think it's a very noisy source. There's an awful lot of stuff out there from people who are not experts. And we know of cases where people have been operating under [false] names that are putting up information about their own company and maybe even some inflated information about their own company.

Abernathy: The most important variable of information is to understand its integrity. The people on the Web don't have a vested interest one way or another about saying what they say. Or maybe they do have a vested interest, and maybe it isn't in your best interest. [We are trying to] align the interests of the people giving information and us receiving it, by making those people owners.

Q: *How can IS managers emulate your approach?*

Abernathy: They can hire an accountant or two to do the balance sheet and the operating statement information [of a company that is a potential investment opportunity]. Or they can team up with a good financial type. There are many aspects of a company to understand. The two most basic are understand the products, and understand the operating statement and balance sheet. Don't forget: Stay within your circle of competence.

Interactive investing takes it one step further than mutual funds. It says to combine your financial assets because there are synergies. However, don't leave the intellect on the table. Each group of money has a tremendous amount of intellect. And if you can be patient enough to cull through that intellect and take the people that are most closely aligned with your investment objectives, then you have a wonderful dynamic.

Q: *What are the best technology areas to invest in today?*

Johnson: I like to divide the forces in the market into three layers. The bottom layer is some real fundamentals that have been marching along for centuries. On top of that is a layer of fundamental technologies that support these long-term trends. On the top layer, I'd put fads; things that come and go, flashes in the pan. Then you've got the fads on top of that. Some aspects of the Web are fads today. Some people put up Web sites just because they are supposed to be putting up Web sites, and they don't have anything interesting to say on a regular basis. Those Web sites just kind of wither and die.

Stock Ticker

The Week in Stocks

Gainers / Losers

PERCENT

Gainers		Losers	
Centigram Communications	32.0	Ross Systems	-14.6
Struct. Dynamics Research	19.6	Retix	-14.3
Radius Inc.	18.2	Interleaf Inc.(L)	-14.3
National Semiconductor	17.7	FTP Software Inc.	-14.1
Merisel	17.1	Lycos Inc.	-13.7
Advanced Logic Research	15.8	Sequent Computer Sys.	-12.9
Brooktrout Technology	15.0	Informix Corp.	-12.2
Systemsoft Corp.(H)	14.0	Software Publishing Corp.	-12.0

DOLLAR

Gainers		Losers	
Centigram Communications	6.13	Seagate Technology	-5.88
Struct. Dynamics Research	4.13	Computer Associates(H)	-4.75
3COM Corp.	3.88	Cisco Systems Inc.	-3.94
Systemsoft Corp.(H)	3.88	Software Spectrum Inc.(H)	-3.50
Dell Computer Corp.(H)	3.75	Informix Corp.	-3.13
Shiva Corp.	3.50	AMERITECH Corp.	-3.00
Brooktrout Technology	3.38	Oracle Corp.	-3.00
American Mgmt. Systems	3.00	Newbridge Networks Corp.	-2.88

Industry Almanac

Diamond in the rough?

Can a company that has made two major gaffes in the past year be a good investment? Actually, yes — as long as the firm is undervalued and well-situated in dynamic, growing markets.

Diamond Multimedia Systems, Inc. (Nasdaq:DIMD) has cast itself as a central player in multimedia circles with add-in graphics accelerator subsystems for PCs. The San Jose, Calif., company is also the third-largest modem marketer in the U.S.

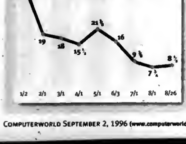
So why isn't the company's stock price soaring? Because of two significant "mismanagement" errors in the past eight months, analysts say.

In January, the company announced a huge and unexplained inventory shortage. "This caused the public perception of [management] negligence," says Youssef Squali, an analyst at Laidlaw & Co. in New York.

More recently, Diamond rolled out a second-generation, three-dimensional graphics product that "cannibalized the earlier version and caused them to have to scrap $10 million [worth] of products," Squali says.

The stock price sank so low it became far undervalued, trading at a market value of almost half of sales. In a recent issue of "The California Technology Stock Letter," editor Michael Murphy wrote that Diamond should be carried higher later this year by its "loyal resellers" as the entire PC market gains momentum. Murphy predicts the stock price will rise to at least about $20 in the next 12 months. Squali predicts the stock will rise into the $12 to $16 range. — *Stewart Deck*

Roller coaster ride



Exch	52-Week Range			Aug. 30 Noon	Wk Net Change	Wk Pct Change
COMS	53.63	33.50	3COM Corp	47.25	3.88	8.9
AIT	60.88	49.50	AMERITECH Corp	31.00	3.00	-5.6
T	68.88	49.25	AT&T	52.25	2.13	-3.9
ASND	71.25	15.38	Ascend Communications	52.73	-2.38	4.7
BNYN	13.63	5.13	Banyan Systems Inc	3.63	-0.08	-1.1
BAY	50.00	29.25	Bay Networks Inc.	27.00	-0.50	-1.8
BEL	60.38	41.50	Bell Atlantic Corp	56.13	-2.50	-4.3
BLS	45.88	33.25	BellSouth Corp	38.50	-1.75	-4.6
BBKT	32.75	6.88	Brooktrout Technology	25.00	3.38	13.6
CS	87.75	50.13	Cabletron Systems	60.63	2.75	-4.3
CSCC	74.75	14.00	Cascade Communications	68.63	1.00	1.5
CGRM	73.13	12.75	Centigram Communications	17.00	6.13	32.0
CSCO	59.38	29.75	Cisco Systems Inc	53.13	-3.94	-6.9
CLUI	9.25	4.50	Compression Labs Inc	6.75	-0.13	1.8
CMNT	10.50	4.00	Computer Network Tech	3.63	-0.13	-2.2
XCOM	14.50	8.00	CrossComm	9.75	0.25	2.6
DIGI	44.88	21.88	DSC Communications	29.69	1.08	-3.5
FORE	80.75	15.38	FORE Systems Inc.	75.00	0.50	1.4
GDC	71.88	9.13	General Datacomm Inds.	10.88	-0.25	-2.2
GSX	42.00	29.00	General Signal Networks (H)	38.88	-1.00	-2.4
GTE	49.25	36.13	GTE Corp	39.38	1.63	-4.0
LU	39.25	29.75	Lucent Tech	37.00	-0.75	-0.7
MCIC	31.13	22.38	MCI Communications Corp	75.50	0.00	0.0
MNPI	34.50	5.50	Microcom Inc	8.50	0.08	0.7
NETM	34.00	7.63	NetManage Inc	8.75	-0.13	1.4
NTRX	10.88	3.63	Netrix Corp	6.50	-0.75	-10.3
NCDI	50.25	2.88	Network Computing Devices	4.88	-0.50	-9.3
NWK	62.00	11.50	Network Equipment Tech.	12.75	0.00	0.0
NETG	27.63	35.00	Network General	17.38	1.25	-6.7
NN	74.25	75.00	Newbridge Networks Corp	57.50	-2.88	-4.8
NT	55.88	31.50	Northern Telecom Ltd	50.13	-0.75	1.3
NOVL	20.61	10.13	Novell Inc.	10.75	-0.38	-3.4
NYN	59.25	42.88	Nynex Corp	42.88	2.00	-4.3
OCTL	30.50	12.63	Octel Communications Corp (H)	29.94	0.94	3.2
ODSI	43.25	16.50	Optical Data Systems Inc.	19.25	0.13	0.7
PAC	35.25	25.88	Pacific Telesis	32.25	-1.88	-5.5
PCTL	44.72	20.75	PictureTel Corp	32.88	2.50	-7.1
PTON	10.75	2.38	Proteon Inc.	2.75	0.00	0.0
RACO	7.63	3.50	Racotek Inc. (L)	3.63	-0.11	-3.3
RETX	10.88	1.81	Retix	6.00	-1.00	-14.3
SBC	60.25	46.25	SBC Communications	46.50	3.63	-5.3
SFA	71.88	11.38	Scientific Atlanta Inc.	13.50	-0.75	-5.3
SHVA	87.25	20.38	Shiva Corp	31.00	3.50	7.4
FON	45.50	29.75	Sprint Corp	40.50	0.88	3.2
SMSC	23.50	10.25	Standard Microsystems Corp	12.88	0.00	0.0
TBIT	13.88	2.38	Telebit Corp	11.00	-0.06	-0.3
USRX	105.50	32.25	US Robotics	52.75	1.75	-3.2
USW	49.38	28.38	U S West Inc	29.63	-0.88	-2.9
XIRC	17.50	8.88	Xircom	12.88	-0.63	-4.6
XYLN	76.00	36.00	Xylan Corp	42.25	2.00	5.0

Exch	52-Week Range			Aug. 30 Noon	Wk Net Change	Wk Pct Change
AALR	10.38	5.88	Advanced Logic Research	8.25	1.13	15.8
AAPL	45.50	16.00	Apple Computer Inc	24.38	0.75	3.2
ASTA	13.88	4.38	AST Research Inc.	5.23	0.25	5.0
CPQ	59.13	73.88	Compaq Computer Corp	56.25	-1.23	-2.2
DELL	67.50	23.00	Dell Computer Corp (H)	67.50	3.75	5.9
GATE	45.00	18.00	Gateway 2000 Inc. (H)	45.00	1.19	2.7
HWP	57.75	36.88	Hewlett Packard Co.	44.00	0.88	2.0
MUEI	29.88	8.75	Micron International Inc.	16.00	1.50	10.3
NIPNY	75.13	49.88	NEC America	33.73	-1.25	-2.3
SGI	43.00	20.00	Silicon Graphics	23.28	-0.75	-1.1
SUNW	67.13	26.38	Sun Microsystems Inc	54.63	-0.50	-0.9

Exch	52-Week Range			Aug. 30 Noon	Wk Net Change	Wk Pct Change
AMH	13.50	8.75	Amdahl Corp	9.94	-0.06	-0.6
DGN	19.13	8.88	Data General Corp	11.13	-0.13	-1.1
DEC	76.50	30.50	Digital Equipment Corp	38.63	0.25	0.7
IBM	128.88	83.13	IBM	114.38	1.25	5.1
MDCO	20.25	7.13	Meridian Data Inc	8.63	-0.50	-5.3
NETF	7.25	2.75	NetFrame	7.88	0.00	0.0
SQNT	75.38	10.13	Sequent Computer Sys.	11.00	1.63	-12.9
SEQS	8.50	1.88	Sequoia Systems Inc	7.23	0.13	5.9
SRA	38.13	16.63	Stratus Computer Inc	18.63	0.00	0.0
TDM	15.25	8.38	Tandem Computers Inc	10.63	-0.13	-1.2
UIS	9.13	5.38	Unisys Corp.	5.88	-0.13	-2.1

Exch	52-Week Range			Aug. 30 Noon	Wk Net Change	Wk Pct Change
ADBE	74.25	28.50	Adobe Systems Inc.	35.38	-0.69	1.9
AMSWA	8.75	1.63	American Software Inc	5.88	0.13	2.6
APLX	42.50	8.75	Applix Inc	24.88	1.38	5.9
ARSW	82.75	20.75	Arbor Software	41.00	1.00	2.5
ADSK	50.00	18.50	Autodesk Inc	23.25	1.75	8.1
BGSS	50.00	29.25	BGS Systems Inc.	44.75	0.00	0.0
BMCS	75.75	32.50	BMC Software Inc (H)	74.75	0.75	1.0
BOOL	26.75	19.25	Boole and Babbage	24.25	-0.25	-1.0
BORL	21.25	6.06	Borland Int'l Inc.	7.50	-0.69	-8.3
BOBJY	55.50	16.25	Business Objects	17.50	-0.25	1.4
CAYN	11.88	4.00	Cayenne Software Inc.	5.00	-0.25	-6.8
CYE	27.88	14.13	Cheyenne Software Inc	18.75	-0.50	-2.6
COGNF	27.38	9.25	Cognos Inc.	23.50	1.25	5.6
CA	50.00	24.88	Computer Associates (H)	33.38	-4.75	-4.2
CVN	15.50	5.75	Computervision Corp	7.13	0.38	5.6
CPWR	46.00	33.50	Compuware Corp	43.00	-2.00	-4.4
CSRE	32.00	10.25	Comshare Inc	14.75	1.50	11.3
COSFF	19.13	8.25	Corel Corp	9.50	0.44	4.8
DWTI	13.75	3.25	Dataware Technologies Inc.	4.00	0.38	8.0
FILE	67.00	20.00	FileNet Corp	74.25	-0.75	1.0
FRTE	81.75	24.75	Forte Software	30.63	0.88	2.9
DDDDF	8.00	3.56	4th Dimension	5.38	0.19	3.6
FTPS	40.63	5.88	FTP Software Inc.	7.63	-1.25	-14.1
GPTA	10.50	3.50	Gupta	4.50	0.00	0.0
HUM	29.88	15.00	Hummingbird Comm. Ltd.	18.88	0.38	2.0
HYSW	28.38	9.75	Hyperion Software Corp	13.00	0.75	6.1
IRIC	16.25	10.00	Information Resources	12.63	0.25	2.0
IFMX	38.75	16.88	Informix Corp	22.50	-3.13	-12.2
INGR	20.13	8.63	Intergraph Corp (L)	8.88	-0.25	2.7
LEAF	12.63	2.88	Interleaf Inc (L)	3.00	-0.50	16.3
ISLI	23.13	7.50	Intersolv Inc.	7.25	-0.13	-1.6
INTU	88.25	31.75	Intuit Inc	37.25	-1.38	-3.6
LGWX	22.25	8.25	Logic Works	9.50	-0.25	-2.6
MAPS	24.00	7.50	MapInfo Corp.	10.88	-0.63	-5.4
MATH	9.25	4.63	MathSoft	8.75	0.13	1.9
MCAF	65.50	17.63	McAfee Associates	59.75	-0.75	-0.4
MENT	72.88	10.88	Mentor Graphics	13.75	-0.06	-0.5
MIFGY	21.25	8.25	Micro Focus	11.13	-0.38	-3.3
MGXI	18.63	9.19	Micrografx Inc	11.23	-0.49	-5.8
MSFT	126.13	29.88	Microsoft Corp	123.23	-1.08	-0.9
ORCL	42.13	23.38	Oracle Corp	35.88	-3.00	-7.7
PMTC	49.50	25.38	Parametric Technology	43.50	-1.38	-2.9
PARQ	14.63	4.38	ParcPlace Systems Inc	4.69	-0.08	-1.3
PSFT	79.25	32.38	PeopleSoft (H)	76.50	-0.75	-1.0
PTEC	20.38	9.88	Phoenix Technologies	17.00	1.50	-8.1
PSQL	14.13	3.13	Platinum Software	9.63	0.00	0.0
PLAT	26.00	9.25	Platinum Technology	11.00	0.13	1.1
PRGS	38.00	12.13	Progress Software Corp	16.38	1.81	12.5
RNBO	75.50	14.63	Rainbow Technologies Inc.	18.13	0.50	2.8

Exch	52-Week Range			Aug. 30 Noon	Wk Net Change	Wk Pct Change
REDB	61.00	18.75	Red Brick Systems Inc	29.75	-2.25	-9.8
ROSS	8.13	2.19	Ross Systems	3.13	-0.88	14.6
SAPE	58.25	29.25	Sapient Corp	43.25	0.50	1.2
SCOC	12.13	5.50	SCO Inc.	6.69	-0.06	-0.9
SDTI	109.00	19.25	Security Dynamics Tech	66.00	-1.75	-2.6
SKEY	91.25	13.38	Softkey International Inc.	17.13	1.00	6.2
SPCO	5.13	1.38	Software Publishing Corp	1.38	-0.19	-12.0
SQAX	39.75	16.00	SQA Inc.	23.75	0.75	3.3
SOTA	18.75	8.50	State of the Art	14.50	0.00	0.0
SSW	81.38	40.00	Sterling Software Inc.	67.88	-2.00	-2.9
SDRC	32.38	16.50	Struct. Dynamics Research	25.13	4.13	19.6
SYBS	39.75	15.38	Sybase Inc.	50.00	0.75	1.6
SYMC	33.25	8.75	Symantec Corp.	9.75	-0.75	-7.1
SNPS	46.75	23.00	SynOpsys	38.00	-0.50	-1.3
SSAX	30.63	8.25	System Software Assoc.	10.25	1.13	12.3
SYSF	31.63	6.38	Systemsoft Corp. (H)	31.63	3.88	14.0
TRUV	10.13	4.38	Truevision Corp	4.88	-0.06	-1.3
VIEW	17.50	9.63	ViewLogic Systems	12.94	-0.50	-4.2
VMRK	19.25	5.75	VMark Software Inc.	8.00	-0.50	-5.9
WALK	12.75	6.25	Walker Interactive Systems	50.88	-0.23	-3.2
WALL	27.50	13.00	Wall Data Inc. (H)	76.75	-2.75	-8.3
WANG	36.13	14.50	Wang Laboratories Inc.	17.50	-0.63	-3.4

Exch	52-Week Range			Aug. 30 Noon	Wk Net Change	Wk Pct Change
AMER	71.00	24.50	America On Line	30.50	1.00	3.2
BBN	40.75	15.63	BBN Corp.	28.38	-0.25	-1.3
CSRV	35.50	10.75	CompuServe Corp	12.25	0.13	1.0
EDFY	55.75	16.25	Edify Corp	23.50	1.75	8.0
LCOS	29.75	3.73	Lycos Inc	6.69	-1.06	-13.7
NETC	91.50	16.00	Netcom On-Line	19.38	1.13	6.2
NSCP	87.00	22.88	Netscape Comm. Corp	35.25	-2.38	-6.6
OMKT	62.75	13.50	Open Market Inc. (L)	13.88	-0.25	-1.8
PSIX	29.00	0.73	PSINet	10.88	0.13	1.2
QDEK	39.50	5.63	Quarterdeck Corp	7.88	-0.13	-1.6
RAPT	39.25	15.00	Raptor Systems	17.50	0.75	4.5
SCUR	64.50	12.00	Secure Computing Corp	13.50	-1.00	-6.9
SPYG	61.00	12.00	Spyglass Inc.	16.75	-1.13	7.2
YHOO	43.00	15.50	Yahoo! Inc.	19.50	-0.38	-1.9

Exch	52-Week Range			Aug. 30 Noon	Wk Net Change	Wk Pct Change
AMD	35.88	10.25	Advanced Micro Devices	12.75	0.00	0.0
ADI	30.13	17.00	Analog Devices Inc	24.00	-0.25	-1.0
CHPS	15.88	7.88	Chips and Technologies	11.00	0.00	0.0
CRUS	61.13	12.63	Cirrus Logic	15.50	-0.63	-3.9
CY	25.75	9.13	Cypress Semiconductor Corp	11.75	0.75	2.2
CYRX	49.75	12.50	Cyrix	13.63	-1.00	-6.8
INTC	83.25	49.81	Intel Corp.	80.00	-2.00	-2.4
LSI	42.50	17.00	LSI Logic Corp	27.00	-0.63	-2.8
LSCC	42.50	19.75	Lattice Semiconductor	28.31	-0.44	-1.3
MCRL	32.50	12.00	Micrel Semiconductor Inc.	18.23	0.50	2.8
MU	94.75	16.63	Micron Technology	22.75	-0.88	-3.7
MOT	81.50	44.75	Motorola Inc	53.38	-1.25	-3.2
NSM	33.63	13.00	National Semiconductor	38.25	2.75	17.7
TXN	83.75	40.50	Texas Instruments	46.88	-0.25	-0.5
VLSI	38.13	10.38	VLSI Technology	13.73	0.13	0.9
WDC	36.50	14.38	Western Digital Corp. (H)	35.00	-1.00	-2.8
XLNX	53.50	23.25	Xilinx	75.38	-1.63	-4.4
ZILG	47.50	20.00	Zilog Inc.	25.25	-1.25	-4.7

Exch	52-Week Range			Aug. 30 Noon	Wk Net Change	Wk Pct Change
APCC	16.88	7.88	American Power Conversion	13.88	1.19	8.4
ADPT	61.50	35.00	Adaptec Inc.	49.31	-1.08	-2.1
CBEX	12.88	3.00	Cambex Corp	3.13	-0.31	-9.1
CGN	7.25	3.38	Cognitronics Corp	3.81	0.00	0.0
CREAF	14.13	3.50	Creative Technology Ltd	4.00	0.06	1.6
RACE	8.38	3.65	Data Race Inc	6.63	-0.13	-1.9
DTM	9.38	4.13	Dataram Corp	7.38	0.25	3.3
EMC	23.38	13.00	EMC Corp	19.23	-0.38	-1.9
EMLX	22.38	6.38	Emulex Corp.	13.56	0.06	0.5
ESCC	29.00	16.50	Evans and Sutherland	23.00	-0.25	-1.1
EXBT	22.73	10.00	Exabyte	14.38	1.13	8.5
INSU	4.13	1.50	Intelligent Info. Systems	1.08	0.19	11.1
IOMG	55.13	2.75	Iomega Corp	14.81	-0.94	-6.0
IPLS	8.75	1.88	IPL Systems Inc.	2.08	-0.19	-8.3
KMAG	37.50	17.63	Komag Inc	21.23	-2.00	-8.6
MTSI	22.75	11.25	Micro Touch Systems Inc.	14.00	0.25	1.8
PEAK	34.75	17.25	Peak Technology Group	22.50	1.25	5.9
PNCL	19.75	4.88	Pinnacle Micro Inc.	7.38	0.38	5.4
AQM	6.75	3.75	QMS Inc.	5.13	-0.38	-6.8
QNTM	36.63	50.88	Quantum Corp	13.50	-0.08	-0.4
ROUSC	8.75	0.94	Radius Inc.	1.63	0.25	18.2
SEG	42.75	36.13	Seagate Technology	42.63	-5.88	11.0
STK	44.13	21.75	Storage Technology	37.38	-0.88	-2.3
STLC	8.75	1.25	Streamlogic Corp	2.81	0.00	0.0
TEK	61.88	29.75	Tektronix Inc.	38.88	-1.00	-2.3
XRX	56.38	30.88	Xerox Corp.	54.88	0.50	0.9

Exch	52-Week Range			Aug. 30 Noon	Wk Net Change	Wk Pct Change
AMSY	33.38	15.38	American Mgmt. Systems	25.25	3.00	13.5
ANLY	63.75	27.75	Analysts Int'l	36.50	-0.50	-1.4
AUD	63.38	31.88	Auto Data Processing	41.50	-1.25	-2.9
CATP	30.73	12.00	Cambridge Tech. Partners	28.19	-0.44	-1.5
CEN	54.88	36.43	Ceridian Corp	42.50	-1.63	-3.7
CDO	28.63	18.88	Comdisco Inc.	26.25	-0.50	-1.9
CHRZ	54.00	11.63	Computer Horizons	27.75	0.88	3.8
CSC	80.75	58.00	Computer Sciences	69.38	-1.88	-2.6
TSK	31.88	13.75	Computer Task Group	28.75	-0.63	-2.1
CPU	49.75	12.88	CompUSA Inc.	49.00	-1.38	-3.3
CDAT	27.50	9.75	Control Data Systems Inc	18.44	-1.31	-6.6
EGGS	13.88	5.00	Egghead Discount Software	8.13	0.25	3.2
EDS	58.63	43.88	Electronic Data Systems Corp	54.25	0.00	0.0
IMAC	27.38	9.13	Inacom Corp	26.63	-0.50	-1.8
INEL	53.50	3.50	Intelligent Electronics	7.13	-0.13	-1.7
KEA	45.29	18.25	Keane Inc. (H)	45.23	2.63	6.2
MSEL	7.50	2.25	Merisel	3.00	0.44	17.1
MICA	16.23	7.75	MicroAge Inc	14.63	0.00	0.0
PAYX	58.00	25.88	Paychex (H)	53.94	0.69	1.3
PMS	55.50	35.50	Policy Management Sys. (L)	35.50	-1.63	-4.4
REY	54.50	31.88	Reynolds and Reynolds	49.88	0.63	1.3
SCBI	30.50	14.44	SCB Computer Tech Inc.	10.23	0.00	0.0
SEIC	26.38	17.75	SEI Corp	21.63	0.13	0.6
SMED	72.13	36.75	Shared Medical Systems	54.00	2.75	6.3
SSPE	30.00	17.00	Software Spectrum Inc. (H)	76.25	-3.50	-11.8
VST	21.13	9.00	VanStar Corp.	21.13	2.00	10.5
SNDT	44.50	25.25	SunGard Data Systems (H)	42.38	0.38	0.9

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Mail interoperability

CONTINUED FROM PAGE 1

All of this translates into a need for a lot of time and money to either pay for extra resources to maintain the current situation or to outsource a customized system that isn't guaranteed to work with future standards.

"Directory integration is really hokey right now and is one of those really hidden costs. That makes it real problematic for us: we have to do our own thing," Crawford said.

"Right now, we have so many directories, and they are so out of sync. It's practically a full-time job just making the changes to each of them. It's not pretty," said Mark Fitzgerald, a user at a large Northeastern firm.

Directory directions

When installing new directory services, consider these issues:

- Choosing a proprietary (inexpensive, but limiting) or X.500 (standard-based, but expensive) directory
- Platforms on which the directories run (OS/2, Unix, NT)
- A naming hierarchy and database model
- Application and directory-to-directory APIs
- Synchronization, replication and updates
- User interface options
- Systems management and administration
- Security, including authentication, access controls, and encryption
- Vendor service and support

Source: Creative Networks, Inc., Palo Alto, Calif.

For example, Fitzgerald's group caa make 50 to 100 changes per day that involve telephone oumbers, mail-stop codes, personnel moves and hirings and firings. That is common. Analysts said the average large business maintains two or three E-mail systems and even more directory services.

There is some light at the end of the tunnel. Several vendors have started taking the first steps toward opening up traditionally proprietary directories (see related story below).

Projects can range from the tens to hundreds of thousands of dollars, depending on the size and complexity of a firm's network. But staying the course costs, too. For example, Nortel, Inc. estimates it costs it more than $400,000 to keep updating its proprietary directory servers.

But concrete relief won't arrive until early next year when products that support the Lightweight Directory Access Protocol (LDAP) start hitting the streets.

More than 40 vendors back the LDAP, which provides a simple way for client software to access information on directory servers.

But it does nothing for server-side integration, which still requires customization work from vendors such as Control Data Systems, Inc. in Arden Hills, Minn.

"There is no such thing as a plug-and-play synchronization product out there today," said Gary Rowe, principal at Rapport Communications in Atlanta.

Users and vendors agree that the future lies with X.500, s working standard that lists, besides basic E-mail passwords and identifications, phone numbers, corporate mail addresses, employee numbers and other data.

But vendors haven't been eager to tackle X.500 because it is complex and difficult to integrate into applications that would need to access directories, such as Notes, Microsoft Corp.'s Office and Oracle Corp. database programs.

In the oext few years, observers said, enterprise computer applications will be able to be built on top of consolidated directories based on the X.500 standard.

Directory assistance

These vendors are trying to improve their directory services offerings:

• Banyan Systems, Inc. plans to ship a version of its StreetTalk directory service for Windows NT by the end of the month, and Novell, Inc. plans to do the same thing for Novell Directory Services next year (see related story below).

• Control Data Systems, Inc. next month will announce new directory service offerings based on the X.500 Internet directory standard. Control Data customers are mostly large companies looking for customized integration of multiple E-mail systems.

• WorldTalk Corp. this week will announce updates to its NetJunction directory software to let users import directory data into applications and manage multiple directories from any location.

• Lotus Development Corp. is developing an X.500 directory called Lotus Pages based on technology from its SoftSwitch division. — *Tim Ouellette*

Chrysler opts

CONTINUED FROM PAGE 1

and infrastructure can be reused at Chrysler Financial, which handles inventory financing for Chrysler dealerships and consumer financing.

Users are happy with the NextStep applications, Anders said. But they have complained that they can't use popular Windows-based applications with the proprietary Next operating system. And that leaves NextStep out of step with Chrysler's plans to standardize on Windows 95.

A Next spokeswoman declined to comment on Chrysler's decision.

Troubled waters

Developers were initially unhappy about the decision. "We're sort of throwing the object baby out with the bathwater, and lots of infrastructure building goes by the wayside," complained one Chrysler Financial developer who asked not to be identified.

But Anders said only two of Chrysler Financial's 120 developers have bailed out in the early stages of the transition. Since June, the company has retrained developers to use Visual Basic for user interfaces and will use Visual C++ to convert as much as possible of the NextStep object code.

The company will also reuse design work done for the Next-based applications, and it has brought in consulting firm Synergy, Inc. in Washington to help with the conversion. Synergy is still identifying what can be reused, Anders said.

"We've had the luxury of being able to give people quickly the training that they need, and there has beeo from day one s clear position that here's where we're going, and we're going to overcome whatever challenges are required to make these goals," said Anders, who wouldo't specify how much the company will spend on the conversion.

The transition is slated to be completed by the middle of next year, to coincide with s rollout of Windows 95 throughout Chrysler Financial. But whether the transition can happen that quickly remains to be seen.

What next?

PROBLEM: It spent four years developing its IT infrastructure using Next Software's object-oriented NextStep but now needs to convert it to Windows 95

BENEFIT: Users get access to desktop productivity applications, including Microsoft Office and Lotus' CC:Mail and Orgaoizer

"A great deal of the investment in object-oriented programming is in the design, even more so than in traditional procedural programming," said Scott Winkler, an analyst at Gartner Group, Inc. in Stamford, Conn. "Once [they] get [their] design right, if it's really working, that might be their leg up in getting the conversion done."

But that leg up may not be enough. "Yes, it is possible to ramp out s new system like this in 10 months, but I don't think it's likely," said Dan Lavin, an analyst at Dataquest in San Jose, Calif.

X.500 holds key to directories' future

The future of directories may lie with X.500, meta directories and open access, but right now, users will settle for solid directories with track record that will get them a small measure of consolidation.

That is why the porting of Banyan Systems, Inc.'s StreetTalk and Novell, Inc.'s Novell Directory Services (NDS) to Microsoft's Windows NT is important for those who consider NT for their enterprise network.

"Meta directories are things that you can't see or touch yet, while directories like NDS and StreetTalk are definite things you can work with today," said Jim Becker, senior network and systems designer at Philadelphia Mental Health Care in Philadelphia.

Windows NT doesn't include an enterprise directory; it depends on complex and hierarchical domains. Microsoft plans to slowly deliver pieces of an object-oriented directory under its Cairo framework in the next year.

So users moving off of Vines or NetWare to NT may want to retain the directory services they have relied on over the years.

"StreetTalk for NT gives us the same functionality of a global directory without being hamstrung by the native Banyan Vines operating system," said Brian Rudowski, network specialist at Public Service Electric & Gas Co. in Newark, N.J. — *Tim Ouellette*

Periodical postage paid at Framingham, Mass., and additional mailing offices. Posted under Canadian International Publication agreement [illegible]. Computerworld (ISSN [illegible]) is published weekly except a single combined issue for the 2nd week in December and the first week in January by Computerworld, Inc., 500 Old Connecticut Path, Box 9171, Framingham, Mass. 01701-9171. [illegible] Subscription rates: [illegible] (Change of address) to Computerworld, P.O. Box [illegible], Marion, OH [illegible].

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Ray Noorda's back — and boy is he mad

Is Ray Noorda a wild man or what? Just about the time people around Silicon Valley started to wonder what had happened to the man best-remembered for leaving Novell just in time, he's back: tanned, rested and suing Bill Gates.

Noorda's Linux company, Caldera, is the proud new owner of DR-DOS, the now-dead DOS-compatible operating system that Noorda acquired at Novell along with the rest of Digital Research. After a promising start, DR-DOS stiffed, to use a record-industry term, and quietly went away. It's sad because DR-DOS was a good product and got Microsoft interested in doing badly needed DOS revisions.

As Novell's CEO, Noorda accused Microsoft of using unfair competitive tactics to kill DR-DOS. Those charges and others were investigated by the U.S. Department of Justice, which led to an agreement under which Microsoft admitted no wrongdoing and promised never to do again whatever it hadn't done in the first place.

At the time, many people thought Novell would take Microsoft to court on its own. But that never happened, and Microsoft's legal problems seemed to pretty much go away. Until a few weeks ago, that is, when Noorda got back into the act. He bought the rights to DR-DOS from Novell and immediately sent his lawyers after Microsoft.

This is the stuff of B-grade action/adventure films. You know, "Noorda's back, and this time he's playing for keeps." That's the sort of programming NBC used to call a "Big Event." Or perhaps we could get Walter Matthau to play Noorda and call the resulting film *Grumpy Old CEOs*.

As Novell's CEO, Noorda was among the ringleaders of the industry's bid to get the feds to do something to Microsoft. The anti-Microsoft forces ended up with next to nothing. Most of the companies that used to go after Microsoft now have been distracted by their own problems or have moved on to other things — sometimes whole other industries. Noorda was left to go it alone. But to do that, he needed a claim. He got that by buying what is left of DR-DOS from Novell.

The whole thing is so wacky that when the press releases arrived, nobody believed it at first. So we surfed over to www.caldera.com and found the release and a copy of the complaint.

Chief among the complaints is the allegation that Microsoft forced hardware OEMs to license DOS for all their machines whether they used DOS or not. That, according to Noorda's attorneys, forced DR-DOS out of business because nobody wanted to pay for an operating system twice.

Does this have any bearing on your IS organization? Only if Noorda wins and Microsoft pays big bucks.

Preliminary results from The Coursey Survey of High Tech Executives show that industry leaders give Noorda only the slightest chance of victory. Microsoft says the issue has already been settled by its agreement with the Justice Department. Overall, you'd have to rate the lawsuit a long shot.

Coursey is an industry analyst, consultant and editor in chief of "coursey.com," an online newsletter that covers personal computing, the Internet and communications. Got a gripe or an idea? Write him at david@coursey.com or visit www.coursey.com.

Flummoxed by objects? Distribute them!

We all want to get to distributed objects, even though that desire remains buried deep in the computing subconscious of many IS staffers.

Haven't many IS shops found objects difficult to work with on a purely local basis? Distributing them increases complexity. So why do I claim we're all waiting for distributed objects?

Because distributed objects are the only way to get the ease-of-use that's embodied in the World Wide Web to work for us in more dynamic ways. The Web is great, as far as it goes. You click on hypertext and leap to the next subject area. But what we really want to do is click on a program button or icon and get the services of another program.

Only by capturing data and methods in self-contained objects are we going to be able to achieve such functionality.

Microsoft, Sun Microsystems, Hewlett-Packard, Digital Equipment, IBM and hundreds of small companies, such as Iona Technologies in Cambridge, Mass., are feverishly working to make sure their distributed objects work over a network.

Take Microsoft's ActiveX. Critics have predicted that OLE objects — one phase of ActiveX — will never get beyond use on isolated desktops, but Microsoft has cultivated the development of thousands of ActiveX components.

And third parties are hard at work to make them interactive with the larger world. Digital is codifying a gateway between Microsoft's Component Object Model — on which ActiveX is based — and the Common Object Request Broker Architecture (CORBA) of the Object Management Group.

HP recently said it will push its ORB Plus 2.0 object request broker to supply two-way interoperability between the Microsoft and CORBA standards by year's end.

An example of advanced distributed objects that use CORBA is taking shape in the hills around Huntington, W. Va., where a pilot health care project, Advanced Research Testbed for Medical Informatics (Artemis), is automating health care records over a two-county network.

A physician who uses Artemis can reach an Oracle database at a hospital and sustain a query session from his office by using scripting language additions supplied by the Artemis system. Artemis overcomes a limitation of existing Internet connections, which must function as solitary actions rather than as a set of sustained interactions.

A doctor might draw upon enough records to reconstruct a patient's recent medical history, add in X-ray or other graphical information and download it to the remote clinic.

Dr. Bruce Merkin, an early user of Artemis at the Valley Health Systems clinic in Wayne, W. Va., says the system, financed with a $4.1 million grant from the National Health Institute, helps doctors, who are frequently frustrated by the lack of patients' medical records.

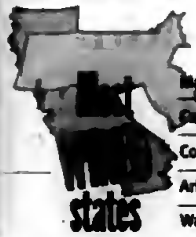
"I'll ask, 'What did they do for you?' and the patient will say, 'They gave me some pills,'" Merkin says. "I'll ask, 'What kind of pills?' and the answer is, 'White pills.'"

With the Artemis system, a standard browser, an off-the-shelf object request broker and some scripting tools invented at the University of West Virginia, Merkin and other doctors are gaining access to the medical records they need, without going back to school for computer science.

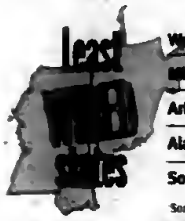
Babcock is *Computerworld*'s technical editor. His Internet address is charles_babcock@cw.com.

Digital states

Cyberconnected states as measured by commercial Internet domains per 1,000 people



	Commercial domains (July 1996)	Per 1,000 people
Massachusetts	17,175	2.85
California	80,491	2.70
Colorado	8,699	2.63
Arizona	7,747	2.10
Washington	9,943	2.04



West Virginia	392	0.21
Mississippi	655	0.25
Arkansas	955	0.40
Alabama	1,685	0.41
South Dakota	295	0.42

Source: InterNet Info, Falls Church, Va.

Digital Frontiers

Want extra cash? Let remote researchers and businesses use your idle computers via the Internet while you eat lunch or sleep.

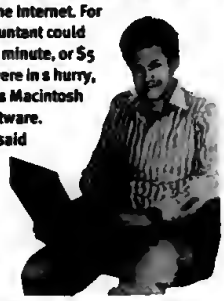
That scenario — called metacomputing — could become a reality once pricing and security issues are resolved, said Baruch Awerbuch, a professor of computer science at Johns Hopkins University in Baltimore.

Under a federal grant, Awerbuch is studying the economics of buying and selling otherwise-dormant computer power over the Internet.

People who need extra computing horsepower or special equipment for a one-time project could post a notice on the Internet. For instance, an accountant could offer 50 cents per minute, or $5 per minute if he were in a hurry, for remote use of a Macintosh with graphics software.

But Awerbuch said safeguards are needed so renters can't pry into the owner's files.

– *Mitch Betts*



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Dallas-Fort Worth International is the first airport to offer road warriors Internet access from public kiosks. The booths, installed by GTE, allow travelers to send and fetch E-mail and surf the 'net via an Integrated Services Digital Network connection. The service is free until October.

Software that lets sinners confess to their PCs drew a rebuke from Germany's Roman Catholic Church, according to a Reuters dispatch from Bonn. "Confession by Computer" lets users pick their shortcomings from a list of 200 and suggests an appropriate penance. "This does not conform to the Catholic understanding of confession," a church spokeswoman said. "You cannot have sins forgiven by the push of a button."

Several Web sites offer the ability to send virtual gifts — actually just digital pictures — via Internet mail. At **www.baskinrobbins.com**, visitors can fill out a form to send an E-cake to celebrate a friend's birthday. At **www.shiner.com/sendbeer.html**, users can send a frosty virtual beer. At **www.virtualflowers.com**, users can send a virtual flower bouquet. And at **www.virtualpresents.com**, the E-gifts include jewelry, food and furniture.

Inside Lines

Operation Gumbo Drop

Many of the 15,000 users who descended on New Orleans last week for Computer Associates International's CA-World '96 were greeted not by glad-handing CA reps but by a barrage of advertisements from systems management rival Tivoli Systems. The crafty Tivoli plastered its name on taxis, bus shelters and billboards across the Big Easy. Perhaps it's payback for last February when CA threw a recruiting party for Tivoli staffers at a hotel across the street from Tivoli's headquarters the day after IBM announced plans to acquire the company.

OS-who?

When IBM opened its AlphaWorks online display of technology demonstrations last week, many OS/2 users were shut out because of a bug in IBM's WebExplorer browser. IBM said the problem is a bug in WebExplorer, and it's trying to make the site, www.alphaworks.ibm.com, OS/2-compatible.

Intel aims to configure

Intel later this month will announce some new configuration management options for PCs as part of the company's initiative to lower the cost of PC computing, sources told *Computerworld*. The offering comes on the heels of the admission by Intel officials that Plug and Play has not lived up to its promise to make PCs easy to use.

Virtually there

IBM's big Sept. 10 mainframe announcement will include a long-promised System/390 version of the company's high-capacity Magstar tape drive but without a key feature called virtual volumes that will let users put multiple data sets on a single cartridge. The feature, which will let users take greater advantage of Magstar's 10G-byte capacity, won't be ready until the middle of next year, sources said. Without the virtual volumes capability, most commercial customers won't be able to make full use of Magstar's 10G-byte cartridge capacity. Meanwhile, tape market leader Storage Technology is working on a Magstar-like tape drive code-named Eagle that's due in 1998, the sources said.

The original Yahoos?

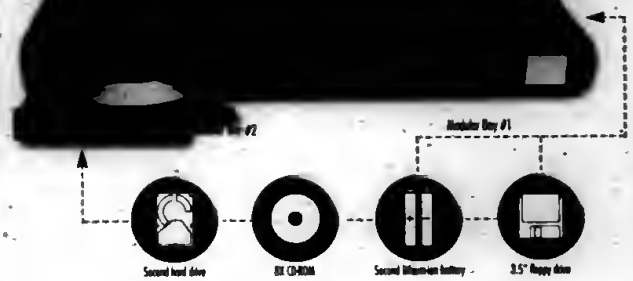
A Texas cake company has filed suit against Yahoo, the search company, to change its logo and to stop using its name on the Internet. Miss King's Kitchen in Dallas has sold cakes known as YA-HOO! since 1980. A ruling on the case should take place in about two months, officials said. Yahoo had no comment on the suit.

Dems vote for GroupWise

Novell may have lost a CEO last week, but the Provo, Utah, firm gained a president. The Democratic National Committee (DNC) used Novell's GroupWise messaging system during the Chicago convention. The DNC and the White House also use the messaging software. The question is: Will President Clinton return the favor and play a part in Novell's launch of the GroupWise 5 upgrade slated for Sept. 12 in New York?

Pause next week to note the official debut of the hard disk drive 40 years ago. Recall when the computing world was largely stuck with punch cards and magnetic tape for storage. Some pursued drum technology, which enabled random access to data — that meant speed by going directly to the desired information. On Sept. 13, 1956, IBM launched its direct access storage device business with the 305 Ramac. And since the birthday of the hard disk drive falls on Friday the 13th this year, celebrate with a backup out of respect for head crashes and disk failures. Then send a news tip in thanks to Computerworld *news editor Patricia Keefe at patricia_keefe@cw.com or call her at (508) 820-8183.*

HOW CAN SOMETHING SO FAST HANDLE SO WELL?



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